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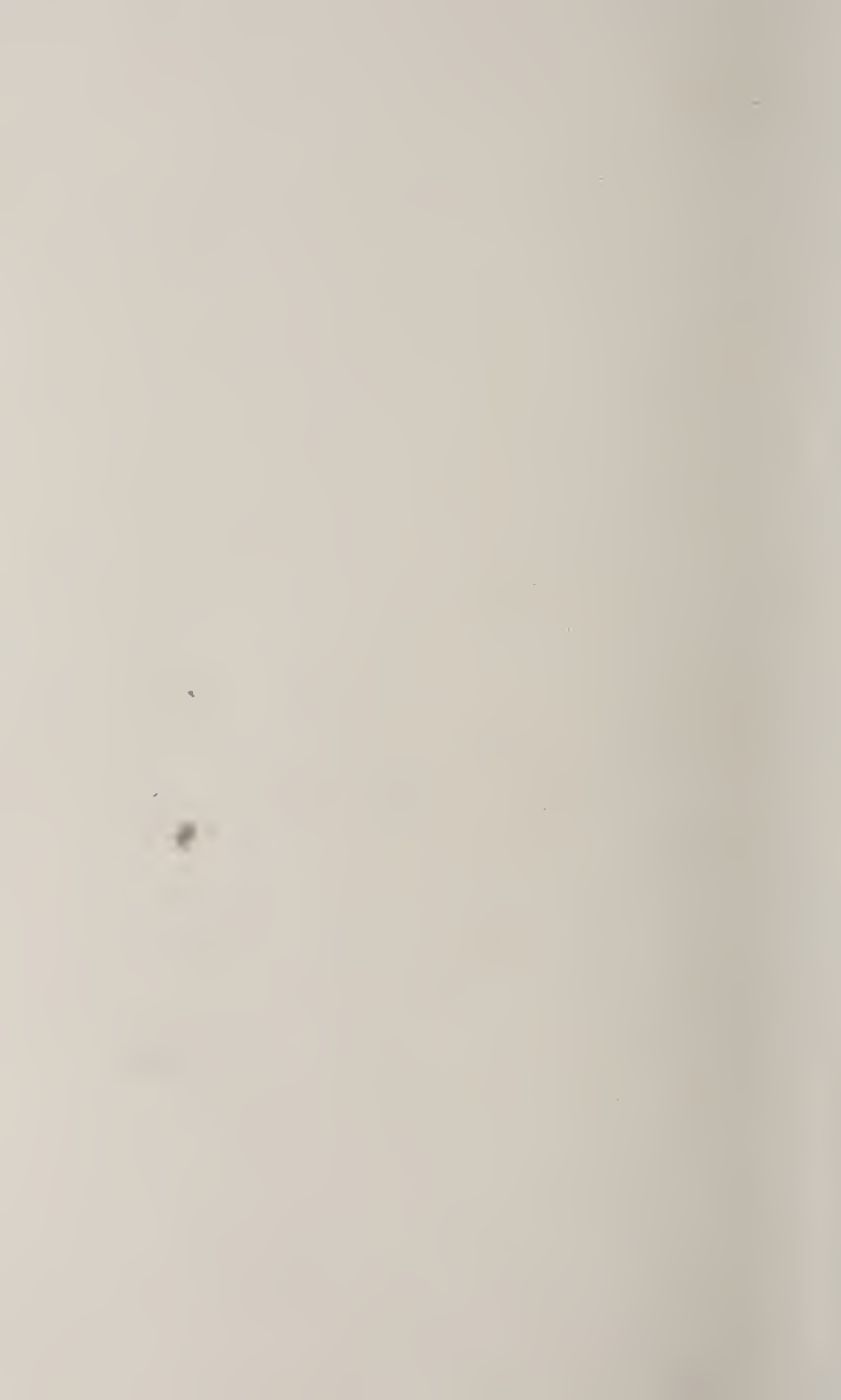
“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted: and it will die away, if they shall entirely cease.”

SIR WM. JONES.

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ASIATIC SOCIETY.

No. III. 1864.

Remarks on the date of the Pehewa Inscription of Raja Bhoja.—*
By Major-General A. CUNNINGHAM.

The age of the Pehewa Inscription of Raja Bhoja has been a subject of difference between Babu Rajendra Lal and myself, for some years past. When he first published the inscription in 1853 (*J. A. S. Bengal*, p. 674) he read the date as 179 *Samvat*, to which I demurred at the time. He again referred to the subject in 1858, (*J. A. S. Bengal*, p. 76) and his remarks lead me to believe that at that time he still adhered to his original reading. But in an article just now published, he has finally come round to my view of the subject by candidly admitting that the forms of the alphaetical characters may be “a good test to some extent,” and that we are fully justified in placing the date of the Pehewa Inscription in the 9th, 10th, or 11th century, (see *J. A. S. Bengal*, 1863, pp. 100, 101).

With this happy conclusion I should have been contented to let the matter drop; but as, during the discussion, several erroneous statements have been put forth by the Babu, some of which affect me personally, I think it right, in justice to myself, to correct these errors at once, lest others should be misled by the Babu's authority to believe that they are actually my opinions.

When the Babu first published his translation of the Pehewa Inscription, I objected to his placing Col. Tod's first Bhoja in the year 179 *Samvat* according to his reading of the Pehewa inscription. When I made this objection I knew nothing more of this inscription than what Rajendra had himself published. But as I knew that two

* For Bábu Rájendralála Mitra's reply to these Remarks vide the Proceedings of the Society for September last (*Ante*, vol. XXXII. p. 437.)—EDS.

Bhojas had flourished at much later periods, namely in A. D. 876 and A. D. 1030, I thought it quite possible that there might have been some omission in the figured date, and that the true reading might perhaps be 1079, instead of 179. Rajendra now states that the actual date is 279, and that the reading of 179 was a misprint in his paper in *one place* (see J. A. S. B. 1863, p. 98.) But on this point I must refer the Babu to his previous article, where he will find that the number 179 is given twice directly, and twice indirectly, or altogether in no less than *four* places. As in the two latter instances this number is obtained by subtraction, I think that the Babu must have altogether forgotten the remarks which accompanied his translation. At p. 674, J. A. S. Bengal, 1853, he gives the date of the inscription as "S. 179 = A. C. 122." Now if S. 179 be a misprint, even so must the equivalent date of A. C. 122 be a misprint. And similarly the Babu's remark that "the first Bhoja lived about three and a half centuries before the time assigned him by the learned historian of the Rajputs" must contain another mistake in the number *three*, which is written at full length. For the date of Col. Tod's first Bhoja is the end of the fifth century (or 483 A. C. as quoted by the Babu in this very paper) from which deducting 350 years we obtain A. D. 133, which is within *eleven* years of A. D. 122, (the equivalent of Samvat 179) but which differs no less than *eighty-nine* years from A. D. 222, the equivalent of Samvat 279. There can be little doubt therefore that when the Babu obtained the date of A. D. 122, and also when he wrote at full length the words "three and a half centuries" he must himself have read the date as 179. The number 279 occurs *once* only in this paper, and that is in the Devanâgari transcript.

A long time after I had made the above objection Mr. Grote kindly sent me a pencil tracing of the date made by Rajendra himself, together with the words *Samvat* and *Vaisâkh Sudi*. On seeing the few letters of these words I wrote to Mr. Grote, as printed in the Bengal As. Soc. Journal, that the inscription was beyond all doubt a middle age one, because the forms of the letters were those of the 11th and 12th centuries, to which I added that I read the date as S. 1190 or A. D. 1133.

Babu Rajendra now writes that Mr. E. Thomas entirely concurred in this reading, and that Professor Weber had also adopted it, but, adds the Babu "none of my critics thought it worth his while to look

to the genealogy of the prince named." He then goes on to say that "it may appear strange that Col. Cunningham and Professor Weber should, from a mere identity of names, infer the identity of persons, and yet both of them found the name of a Bhoja in the monument under notice, and *per saltum* came to the conclusion that it was that of Dhâra, overlooking," &c. As the most complete refutation of this strange statement, I need simply refer the reader to the difference of one whole century between the date of A. D. 1133, as suggested by me, and that of A. D. 1030, the well-ascertained period of Raja Bhoja of Dhâra.

In my proposed reading of the date I assumed that a single cypher had been unintentionally omitted. But this assumption the Babu declares to be "a guess at random which can claim no confidence," although I had most pointedly drawn his attention to a blundered date in one of my Kajraha inscriptions (J. A. S. B. 1860, p. 396), a facsimile of which inscription was with the Babu when he penned the above paragraph about a random guess. I will now further refer him to the Buddha Gaya inscription published by himself in J. A. S. B. Vol. XXVII. p. 74, for an actual omission either of the final letter of the word Samvat, or of the initial cypher of the date. I refer also to this particular inscription on account of the date itself, which has been misread by Rajendra as 781, instead of 981. I grant that, in 1858, before he had seen my Gwalior inscription of S. 933, in which the figured date is accompanied by a written one, it was only natural that he should have read the Buddha Gaya date as 781. But the case is altogether altered when in the present year he still quotes this same inscription as being dated in 781, and makes use of this erroneous date to prove that the Kutila character had a range of at least four centuries, or from Samvat 781 = A. D. 724 to 1124. That this might be true no one, to my knowledge, has ever denied, and it certainly was not likely to have been denied by me when I have had in my possession for many years the following dated inscriptions in slight varieties of the Kutila character.

Inscription from	Bajjnâth,	dated	Sâke 726 = 804 A. D.
Ditto	„ Gwalior,	„ Samvat 933 = 876 A. D.	
Ditto	„ Kajraha,	„ „ 1011 = 954 A. D.	
Ditto	„ „ „ „	1058 = 1001 A. D.	
Ditto	„ Gwalior,	„ „ 1161 = 1104 A. D.	

As in these inscriptions we have a range of exactly three centuries, we may safely extend the range of the use of the Kutila character to at least four centuries, or say from A. D. 750 to 1150. There are of course some differences between the forms of the earlier and later letters, but the general appearance of the writing is essentially the same. But when an inscription in the Kutila character was seriously referred to the year 179 of the Vikramaditya Samvat, or to A. D. 122, I certainly did object, and I do so still.

With regard to the Kutila character I have to point out another misstatement regarding myself which has been made by Babu Rajendra Lal. In the article now under notice on Raja Bhoja of Dhâra (Bengal Journal, 1863, p. 101) the Babu says "the so-called *Kutila*, or the 'crooked' character, which according to Col. Cunningham owes its name to a mislection of the word *Kumuda*, or the 'lotus-like.'" On this subject I beg to refer the Babu to the Society's Journal for 1860, p. 394, where he will find that I have made no mention of the word *Kutila* at all; I simply corrected the word *Kakuda*, or "bad," which was most absurdly applied to the alphabetical character of one of the *Kajrâha* inscriptions, to *Kumuda*, or "beautiful." It is true that I once thought it possible that the word *Kutila* of the Bareilly inscription might also be, what the Babu calls a "mislection;" but I confined my published opinion to the word *Kakuda*, and kept my thoughts regarding the word *Kutila* to myself. Since then I have examined the *Kutila* inscription itself, and I find that the word is correctly rendered. *Kutila* means "crooked, or bent," and I would refer the epithet to the sloping or bent stroke which is attached to the foot of each letter. Apparently the Babu did not think it "worth his while (I quote his own words, vide p. 98 of Journal for 1863) to look to" the actual statement which I had published in 1860, and, trusting to his memory, has unintentionally made this statement regarding me.

Rajendra Lal has now given a facsimile of the Pehewa inscription, the date of which he says is "unmistakeably Samvat 279." (See p. 97.) But here I must again differ with him, for the middle figure of his facsimile is a 1, and not a 7. The day of the month also has been misread, as the figure of the facsimile is a 1, and not a 7. The first cypher of the date, as now given, looks certainly more like a 2 than any other figure, and the last cypher, according to my reading, is a 6, thus making the whole date 216. This might possibly refer to the

Sri Harsha era of 607 A. D., which would bring the date of the inscription down to A. D. 823. But if the middle figure is actually a 7 (as read by Rajendra, although his facsimile gives a 1) then the date would be 276, or A. D. 883 if referred to the Sri Harsha era, a period which would enable us to identify the Bhoja of the Pehewa inscription with his namesakes of Gwalior in A. D. 876, and of the Raja Tarangini in A. D. 883 to 901. I will endeavour to examine the original inscription during the ensuing cold weather, as I have a suspicion that the first figure of the date is not a 2, but either a 1 or a 9. In the pencil tracing sent to me by Mr. Grote the figure is a 1, and so it was read by Rajendra himself, as I have conclusively shown in the opening paragraphs of this paper.

Babu Rajendra has drawn attention to another Raja Bhoja, to whom allusion has been made by Professor Hall in his "Vestiges of the royal lines of Kanauj," with the dates of 960 and 964. To this monument the Babu states that I probably refer (see p. 96 of his article) in my letter published in the Journal for 1860, p. 395. But here again (to use the Babu's own words) he did not think it "worth his while to look to" my actual statement. Had he done so he would have found in J. A. S. B. 1860, p. 395, that I referred to the Gwalior Bhoja Deva inscription with its date of Samvat 933, "both in words and figures." In the same letter I added that "the form of the figure 9 in this date is the same as that which Rajendralal has read as 7," that is, in the Buddha Gaya inscription already quoted. Notwithstanding this direct notice of his misreading of the figure 7, the Babu, in his very last article on Raja Bhoja, has again brought forward this erroneous date of Samvat 721 to prove that the Kutila character was in use as early as that time. I may add that the Babu is equally wrong in his statement that the inscription referred to by Professor Hall, was found "at Gwalior." It is believed to have been found somewhere in the Gwalior territory, but the actual site is not known. It is certain, however, that it was not found "at Gwalior."

In the remarks which accompany his translation of the Bhoja Deva inscription of Gwalior, of which the date, *Samvat* 933, is given both in *words* and in *figures*, Babu Rajendra (J. A. S. Bengal 1862, p. 399) states that "the date is open to question." "The first figure," he adds, "is peculiarly formed, and may be taken for a 7, which would carry the prince to A. C. 676 = S. 733, or within eleven years of the

second Bhoja of Colonel Tod, with whom he may be taken to be identical." Here then we have the Babu deliberately committing the very error, which he has erroneously attributed to me. It is Rajendra himself who has "hastily jumped to a conclusion regarding the age of a dated inscription from the mere circumstance of the word Bhoja occurring in it."

Hitherto I have spoken only of Rajendra's errors of commission, of which I have to complain, as most of them affect myself personally. I will conclude with noticing his errors of omission, which are equally unfair towards me, and one of which has been the cause of error in others.

In his last article on the Bhojas (*J. A. S. Bengal*, 1863, p. 97) after mentioning the names of Bhoja Raja of Dhâra, and the Bhoja of the Raja Tarangini, Rajendra says, "The second of these princes I *assume* to have been identical with the sovereign named in an inscription on a Vaishnavite temple at Gwalior. He is described as a lord paramount, who flourished in A. C. 876." In this paragraph the Babu *assumes* the identity without making any reference to my letter, published in this *Journal* for 1860, p. 395, in which this identification was first made known.

A similar omission of my name occurs in the Babu's latest account of the Rohtas inscription, of which a translation was published in Vol. VIII. of this *Journal*, p. 695. In my letter, printed in this *Journal* for 1860, p. 395, I first pointed out that this inscription gave the genealogy of the Tomara Rajas of Gwalior, and that the name of the fourth prince, Dungara, had been misread as Hungara. In his *Vestiges of the kings of Gwalior*, published only last year, the Babu adopts this identification of the genealogy without acknowledgment and adheres to the name of Hungara in the Rohtas inscription, without mentioning my opinion that it is erroneous.

The last instance of the Babu's omissions, which I shall notice, is a more serious one, namely his adoption of my reading and identification of the *Huvishka* of the Wardak and Mathura inscriptions with the *Hushka* of the Raja Tarangini, without any mention of my name (see his translation of the Wardak inscription in this *Journal* for 1861, p. 339). My reading of the name of Huvishka in the Wardak inscription, and my identification of this prince with the Huvishka of the Mathura inscriptions, and also with the Hushka of

the Raja Tarangini, will be found in this Journal for 1860, pp. 400, 401. This silent adoption of my identification has enabled Mr. Thomas to ascribe it to Rajendra himself (see Journ. Royal Asiat. Soc. Vol. XX. p. 108 ; note 2.)*—and Mr. Thomas's authority, added to the Babu's own silence, has induced Professor Dowson to do the same. In the same Vol. of the Royal Asiat. Soc. Journal, Mr. Dowson writes as follows regarding Rajendra's translation of the Wardak inscription,—“ Before proceeding to criticise I will perform the more grateful task of applauding the success he has achieved, *especially* in the *reading of the name of the king* and in *identifying* him with the Hushka of the Raja Tarangini. This alone would have been a valuable gain.” Here then we see that the two points in the Babu's version of the Wardak inscription, to which Professor Dowson has awarded special praise, are precisely those two which the Babu has adopted from my published letter without any acknowledgment whatever.

Extract from a letter from Major-General CUNNINGHAM.

Dated, Nynee Tál, 24th May, 1864.

“ I have succeeded in clearing up the whole mystery of the date of Raja Bhoja in the Pehoa inscription, which is *written at full length in words*, as well as in figures. The date is 276—Rajendra has misread the name of Bhoja's father, which is *Rámabhadra Deva*, and not *Rámachandra Deva*, as may be seen most distinctly even in his own facsimile. This correction is most important, as it enables us to identify both father and son with two of the Rajas of Kanoj, whose names are given in the Benares copper-plate. To this identification Rajendra will object that the genealogy of the Pehoa inscription prior to Rámabhadra differs entirely from that of the Benares copper-plate ; and so it does differ beyond all doubt ; but there is no such genealogy in the Pehoa inscription of Raja Bhoja ! The explanation of this

* In the same volume, p. 99, in an article read on the 5th July, 1862, Mr. Thomas describes a square copper coin of *Epauder* whom he calls a “ new king.” But the name of this king had already been made known by me in this Journal for 1860, p. 396, from a similar copper coin in my own possession. Since then I have obtained a hemidrachma of *Epauder*, in bad order, and another copper coin in very bad preservation.

seeming mystery is simple enough. There are *two* distinct inscriptions at Pehoa, which have been taken by Rajendra Lal as forming only one record. The first inscription of twenty-one lines which contains the names of Mahendra Pâla, Vajrata, Gogga, &c., is given by Rajendra quite complete; but of the second inscription he has given only eight lines out of sixteen and a quarter lines. It is this second inscription which contains the names of Raja Râmabhadra Deva, and Raja Bhoja Deva, together with the date, which is written at full length in words, as well as in figures—thus :

samvatsare satadwaye shadsaptatyadike (?)

Vaisâkhamâsa sukla paksha saptasyâm.

Samvat 276 Vaisâkha sudi 7.

all of which may be read in Rajendra's own facsimile.

The date of the inscription being thus conclusively settled, it now remains to ascertain the era to which the date refers. This I believe to be the era of *Sri Harsha* of Kanoj, beginning in A. D. 607, which would make the date of the inscription A. D. 882. Now at this very time we know that a Raja Bhoja Deva was paramount sovereign of Gwalior, as his inscription, carved on the rock itself, is dated in Samvat 933, or A. D. 876. From the Raja Tarangini also we learn that a Raja Bhoja contended with Sankara Varmma of Kashmir, who reigned between the years 883—901 A. D. I am quite satisfied that all these records refer to the same Prince, Bhoja Deva, who was Raja of Kanoj during the last quarter of the 9th century, or from about A. D. 875 to 900.

To prove this last statement it will be sufficient to show that Bhoja Deva, son of Râmabhadra Deva, was Raja of Kanoj about the date specified. Now the genealogy of this family, consisting of eight names, is given in the Benares copper-plate (Journ. As. Soc. Bengal, XVII. 71) in which Râmabhadra Deva and Bhoja Deva are the 4th and 5th names. The date of the inscription which is recorded in the reign of Bhoja's great grandson, is 65, which must refer to some recent era, and is not therefore of any assistance in fixing the actual date of this copper-plate. But the name of Bhoja's great grandfather, *Vatsa Raja*, is found in another copper-plate which is dated in 730 of the *Sake Salivahâna* or A. D. 808. In this record it is stated that *Paura Raja*, the father of the inscriber, had conquered *Vatsa*

Raja "who had become intoxicated with the wealth of the king of Gaur," (see Journ. Royal As. Soc. V. 350). According to this statement *Paura Raja* must have been reigning just one generation, or twenty-five years, prior to A. D. 808, or in A. D. 783. His antagonist *Vatsa Raja* may therefore be dated about A. D. 800, and *Vatsa's* great grandson *Bhoja Deva* about seventy-five years later, or in A. D. 875.

The result of all these concurring dates is to give us a very good and almost continuous outline of the history of Kanoj from the end of the sixth century down to the Muhammadan conquest, or for upwards of six centuries. The different dynasties may, according to my view, be dated as follows.

I.—BAIS RAJPUTS.

- A. D. 575. Prabhâkara Vardhana.
 600. Râjya Vardhana.
 607. *Harsha Vardhana*, founder of the era.
 650. (Harsha's death).
 700. Ranmal, invaded Sind (Journ. As. Soc. Beng. X. 188).
 715. Harehand, contemporary of Muhammad bin Kâsim (Abul Fazl).
 730. Yaso Varmma, conty. of Lalitaditya of Kashmir (Raj. Tar.)

Benares copper-plate.

775. Devasakti Deva.
 800. Vatsa Raja Deva.
 825. Nâgabhatta Deva.
 850. Râmanabhadrâ Deva, } of Pehoa inscription.
 875. Bhoja Deva, }
 900. Mahendra Pâla Deva.
 920. Bhoja Deva II.
 930. Vinâyaka Pâla Deva.

TOMARAS.

979. Sallakshana.
 1005. Jaya Pâla.
 1021. Kumâra Pâla.
 1051. Ananga Pâla, refounded Dilli.

RATHORS.

1050. Chandra Deva.
 1080. Madana Pâla.
 1115. Govinda Chandra.
 1165. Vijaya Chandra.
 1175. Jaya Chandra.
 1193. *Muhanmadan conquest.*

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*Note on the Fossils in the Society's Collection reputed to be from Spiti.—By T. OLDHAM, Esq., F. R. S., &c., &c.*

In the Journal of the Asiatic Society of Bengal for the present year (1863), page 124, a paper is published descriptive of some of the fossils collected by Dr. Gerard in the Spiti district in the North-Western Himalaya, which fossils had been in the Society's Museum for many years, having been presented by Dr. Gerard in 1831.

The paper referred to, is said to be a 'revised copy' of one read before the Society in November, 1861. The original paper, of which a brief abstract was given in the Journal of the Society, 1861, page 418, had been ordered for publication by the Council of the Society, but some delay occurred in the preparation of the plates to illustrate it, in consequence of the author having temporarily left India at the time, and it was not issued. Meanwhile changes in the author's views having taken place, he first desired that the paper should be issued as originally drawn up, with a postscript, but subsequently on his return to India he states that he 'withdrew' the paper and 'modified' it into its present form in which the conclusions arrived at are in several important respects just the opposite of those originally announced.

This was indeed, as the author says, "A very considerable alteration;" but the paper in its present form never having been submitted either to the Council, or to the Society, having been in fact withdrawn, and so altered without the sanction of the Council having been obtained, there has been I regret to say, no opportunity, previously to its publication, of communicating with the author.

It is not my intention to discuss in any way the correctness or incorrectness of the identification of species in the collection. This



important question can only be taken up with advantage, when the whole series of the fossils from the same localities, now in other collections, shall have been examined. My present remarks are confined solely to the brief and general notice which Mr. Blandford has prefixed to his paper, and to the results there announced.

The facts appear to be these. In 1828 Dr. Gerard collected in the valley of the Spiti and in adjoining localities, a large number of fossils, (Gleanings in Science, Vol. I. page 109.) Of these a selection was forwarded to the Asiatic Society in 1831, (Gleanings in Science, Vol. III. p. 92.) These fossils excited great attention both from the interest attaching to the fact of their having been found in the very heart of the Himalaya, and also from the marked similarity of some of the species to known English forms. The collection was almost immediately examined by the Rev. Mr. Everest, and, at his request, a portion of it was sent to England to Mr. Sowerby. On the 8th of June, 1831, Capt. Herbert read a paper on these organic remains, which was published with a plate, in September of the same year (Gleanings in Science, Vol. III. p. 265.) This plate was a small etching from the more finished drawings of the same fossils prepared to illustrate the paper by Mr. Everest published in the 18th Volume of the Asiatic Researches, p. 107. Both these plates and reduced etching were prepared by Mr. James Prinsep himself. Again in 1832, Captain Gerard on the part of his brother forwarded to the Society 164 packets of fossils from the Himalaya, (Journ. As. Soc. Bengal, Vol. I. p. 363,) and in October he forwarded the first part of his brother's paper on Spiti, which also appeared in the 18th Volume of Asiatic Researches. Meanwhile Mr. Sowerby's reply to the reference of these fossils to him was received, dated October 14th, 1831, confirming Mr. Everest's conclusions, (Journ. As. Soc. Bengal, Vol. I. p. 248.)

From all this, it is clear that no time had been lost in taking up the examination of the fossils sent by Dr. Gerard; that these fossils came at once into the keeping of Mr. James Prinsep, were examined by Mr. Everest, and by Captain Herbert; were carefully drawn; that a portion of the collection and the figures were then submitted to Mr. Sowerby, and were *at once by him recognized as similar to others from the same localities which he had seen with Mr. Stokes and Dr. Buckland.* I conceive that the names alone of the gentlemen I have mentioned are abundant guarantee that no sufficient care was wanting

on their part to prevent any admixture of fossils from any other collection with those sent by Dr. Gerard. It seems beyond a question that Mr. Prinsep, Capt. Herbert, Messrs. Everest and Sowerby were all quite satisfied that the fossils figured on the plates I have referred to, had actually come from Dr. Gerard, and whatever confusion or neglect may have resulted in after years, the Society's collections at that time were certainly not in the disgraceful state of which Mr. Blanford so justly complains. It is then, I think, certain that these fossils from Dr. Gerard had not been accidentally mixed with the English fossils *after* they had come to Calcutta, and I think every one who reads Dr. Gerard's papers will also admit that he did not carry with him a collection of English Liassic fossils with which the Spiti collection could be 'accidentally' mixed, *before* its despatch to Calcutta. It must be borne in mind also that the plates of these fossils were published within a comparatively short time of discovery of them, when the error of having any admixture of English fossils could have been discovered.

Of seven species of ammonites so figured by Mr. Prinsep, and described by Mr. Everest and Mr. Sowerby as part of Dr. Gerard's collection, the author of the paper I refer to entirely rejects as 'spurious,' and as being English specimens, no less than five. Others, although there is not nearly so much evidence of their being from Spiti, are as unhesitatingly admitted as genuine.

M. Jaquemont visited the neighbourhood of Spiti in 1830, and brought away a noble collection of fossils which have unfortunately since remained undescribed in the Museum, Paris (with the exception of one or two species noticed by L. Von Buch.) Subsequently in 1860, I despatched Messrs. Theobald and Mallet, both of the Geological Survey of India, to Spiti, during the time when work in the plains of India was impracticable, with instructions to bring away as full a collection of fossils as the time they could devote to it would permit, and to make such notes and observations as would elucidate the Geological structure of the district. A brief account of the trip was given to the Society by Mr. Theobald and published in 1862, (Journ. As. Soc. Bengal, 1862, p. 480.) The collection made by these gentlemen was a good one considering the brief time at their disposal, but could not at all be accepted as fully illustrating the Geology of the valley. Mr. Theobald subsequently, in the spring of 1862, when

putting out and examining these fossils collected by himself, and Mr. Mallet, visited the Society's Museum to compare those species already named and described by Mr. Blanford. Among these he noticed several species of which *no* specimens had occurred to himself or to Mr. Mallet, and on examining these specimens more closely he noticed also a difference in the mineral character of the rock in which these species occurred. He at once, too hastily as I think, and without examining into the history of these fossils, but knowing well the neglect with which the Society's collections had been treated, came to the conclusion that these were not fossils from Spiti at all, but were English Liassic fossils, which had got mixed up with the true Spiti fossils. This idea he communicated at once to Mr. Blanford who at first rejected the notion, but subsequently, as stated by himself, adopted it fully.

Believing that there are no sufficient grounds for this conclusion, I cannot avoid noticing it. The question as regards Dr. Gerard's fossils alone would be of minor importance, but this matter involves a principle subversive of all sound progress in our knowledge of the Geological distribution of organic remains.

The grounds on which Mr. Blanford has rejected all those fossils which he had identified with English Liassic species are stated to be these.

1. Mr. Theobald's belief to that effect, which belief I know to have been based on a consideration of a slight difference in the mineral character of the rock.

2nd. An examination of undoubted Whitby fossils.

3rd. An examination of Col. Strachey's collection from the Niti pass, north of Kumaon.

4th. An examination of General Hardwicke's collection from Nepal, and—

5th. An examination of Jacquemont's collection from near Spiti.

Putting out of the question for the moment Jacquemont's collections which were from nearly the same ground as Gerard's, I cannot see in what way the nature of the fossils found at Whitby in Yorkshire, of those found in Nepal some five hundred miles off, or at Niti more than one hundred miles off, can possibly determine the *fact of the occurrence or non-occurrence of certain forms at Spiti*. There is no question here as to the identity or even the similarity of the species, in determining which a comparison of the others would un-

questionably be useful; the question is simply do they occur, or do they not. I reject as useless also, in any bearing on this fact, the consideration of the nature of the rock in which they are found. Differences or resemblances in mineral character are utterly worthless as guides to such facts.

The non-occurrence of the species referred to in Jacquemont's collection, and in that made by Messrs. Theobald and Mallet remains. Now did two persons visiting even a single quarry to collect fossils after an interval of time ever come away with the same species? But here was not a quarry but a district stretching over some fifty miles of difficult country. The fact that these species did not occur to Jacquemont, or afterwards to Theobald and Mallet, no more disproves the fact they had previously occurred to Gerard than any other case of this kind. It might just as conclusively be argued that some of the beautiful fossils from the cretaceous rocks of S. India which were originally collected by Messrs. Kaye and Cunliffe and described by E. Forbes, were not from that district at all, but from some other and far distant locality, and had been 'accidentally mixed' up with their genuine collections, because the same species were not met with by Mr. Blanford himself in his subsequent and much more detailed examination of the same area.

But there is still another and to my mind a conclusive proof that the specimens rejected by Mr. Blanford did really belong to Gerard's collections, a proof which I should have been glad to communicate to Mr. Blanford had there been an opportunity. A reference to Mr. Sowerby's letter which I noticed above, will show that similar fossils are said to have been in the possession of Dr. Buckland. To that Geologist, then one of the most zealous palæontologists in England, a fine series of these Spiti fossils were sent by Dr. Gerard himself. This collection still exists among the other treasures of the Oxford Museum, and I had the pleasure of going over it carefully with Prof. Phillips last year, having visited Oxford for the purpose. It cannot be supposed that in this series also Whitby or English fossils had got mixed either 'accidentally' or otherwise. The care with which the collections at Oxford have been kept is sufficient to render this idea untenable for a moment. But in this (Gerard's) collection at Oxford are several specimens of several of the species\* noticed by Mr. Blan-

\* I may mention notably *Ammonites bifrons*, *Am. communis*, both of which



ford, and by him rejected as spurious Spiti fossils. I think this fact quite conclusive, and that all the specimens so hastily rejected as Spiti fossils by Mr. Blanford must be restored to their proper place in this interesting and valuable collection.

I said before that I had only to deal with the facts, what the conclusions derived from those facts may be is not now under discussion, and whether there be in the Spiti district Liassic beds or whether these Liassic species\* occur in the same beds with others, supposed to belong to different periods are questions which must await future solution. I regret that the circumstances I have mentioned above, (viz., that this paper by Mr. Blanford in its present state never had come before the Society or Council) prevented my having an opportunity of making the author acquainted with the fact, that in another portion of Dr. Gerard's Spiti collections, several specimens existed of the very species which, on such insufficient grounds, he has rejected here.

I cannot, however, conclude without again directing serious attention to the very great mischief arising from dealing with questions of fact in this way. If the fact of the occurrence of certain forms in certain places is to be thus questioned, and fancy or some supposed mineral resemblance is to be accepted as negating the deliberate statements of those who had collected the fossils, supported by the evidence of careful investigators who had examined these fossils almost immediately after their discovery, (and not thirty years after), there can be no progress. It would be infinitely better, and infinitely safer, to leave such specimens, as they are said to have been found, without labels, or even to throw them out, than to falsify all the landmarks of science by exhibiting them with localities attached which are only imaginative. The specimens referred to are now (September 18th, 1863,) put out in the Society's Museum (by whose authority I know not) mounted and carefully named and marked, *Upper Lias, Whitby, England*, without any note of doubt, and without any reference whatever to the fact that they had ever been even supposed to come from Spiti. Collections thus treated are worse than useless, they are mischievous.

occur in the Society's collection; also *Am. crassus*, Phillips, a true Liassic species but of which specimens do not occur in the Society's cabinet.

\* *Ceratites Himalayanus*, Blanford, is exhibited in the Society's collection as from the *Upper Lias*, Spiti valley.

*Notes on the variation of some Indian and Burmese Helicidæ, with an attempt at their re-arrangement, together with descriptions of new Burmese Gasteropoda.*—By W. THEOBALD, Esq., Junior.

Since my paper on the distribution of our Indian terrestrial Mollusca was read at the February meeting of the Asiatic Society, several new species have accumulated on my hands, which I propose to describe in the present paper, and at the same time, to offer some remarks on certain nearly allied forms, which a careful examination compels me to consider, as merely well marked and persistent types of one species, connected as they are by intermediate forms, whose number is constantly on the increase.

The question of where variation ends and specific separation is called for, is of course not easily settled by any precise rule, and has always been regarded as depending more or less on the peculiar views or idiosyncrasy of the individual naturalist, and has resulted in the manufacture of an erroneous number of new species, ostensibly of equal value, but many of them in reality entitled to no higher rank than varieties. I myself have offended in this way; but whilst deprecating for the future the creation of species, in the unqualified manner hitherto too common, I prefer a specific (or sub-specific) name for all well marked local forms, to the method advocated by some, of indicating such shells by a letter of the alphabet, as var A or var B of the type, or first described individual, however little it may merit such distinction save on the ground of mere priority.

My friend Mr. H. F. Blanford, has already done good service by decimating the ranks of shadowy species ranged under the genus *Tanalia*, in his paper in Volume XXIII. of the Linnæan Transactions, wherein he reduces the *twenty-six* recorded species of the genus to *two*, *Tanalia violacea*, Layard, and *T. aculeata*, Gmel. which last shell exults in no less than twenty-four synonyms, (twelve contributed by Reeve, nine by Dohrn and three by Layard).

This genus (*Tanalia*) well illustrates in my opinion the advantage of retaining a distinctive name for well marked types of what, critically viewed, is but one species, for a considerable amount of obscurity, quite unredeemed by superior brevity, results from the use of simple letters, rather than well chosen and distinctive epithets for well marked local types, many of which have hitherto, though erro-

neously, stood as distinct species. Whilst therefore concurring in the results of Mr. Blanford's examination of the genus *Tanalia*, I would prefer retaining the known designations of such well marked types as *T. Tennentii*, *T. neritoides*, and the like, to recording them all as *T. aculeata*, Geml. var. A or var. B.

The alphabetical or numerical method of discriminating varieties, would certainly possess considerable advantages if all the varieties of a species could be arranged in an unbroken right line, instead of one very much given to ramification, but even in that case the type species by priority would often have to be set aside, as falling naturally into some other position, than at the head of the series; I therefore shall retain, in this paper, many names which I now regard as of merely sub-specific value instead of discarding them *in toto* as soon as their identity, if critically considered, with some previous species is established; and shall on the same principle, bestow distinctive names on those which of the shells herein described I regard as merely local races.

It might at first be imagined that strong support was derivable, from the enormous variation of form of some widely spread species, for the Darwinian view of the gradual extension by migration of all species in space, and the simultaneous change undergone by them, to meet changed conditions of existence, resulting in local types, and ultimately by the decay of intermediate forms, in so called distinct species; but this idea is speedily negatived by the consideration, that though some species exhibit an amount of variation, which might be plausibly accounted for by the Darwinian theory, yet others not less widely spread, either as to time or place, exhibit little or no such tendency, which seems rather a peculiarity (of temperament so to say,) marking certain species, than the result of a general law regulating the development of all. A notable example of this is afforded by the little *Helix labyrinthica*, Say, which has remained unchanged during the eons which have elapsed since the Eocene period, occurring fossil in the Headon beds on the Isle of Wight, and living at the present day in Alabama. *Bulimus punctatus* and *Bulimus pullus*, Gray, may also be quoted, the first species inhabiting, unchanged to any perceptible extent, the plains of India and the shores of Mozambique, whilst the last ranges widely through India and some of the neighbouring countries, (Burma and even the shores of the Red Sea,) and occurs fossil in the alluvial deposits in the Nerbudda valley, where individuals, undis-

tinguishable from recent specimens, accompany the extinct fauna which embraced the Hexaprotodon and its congeners: (vide Memoirs of the Geological Survey, Vol. II.)

Of species subject to considerable local variation, *Helix Huttoni* may be selected, if, as I am inclined to think, it may be regarded as specifically identical with *H. rotatoria* V. dem Busch; and the highly variable *H. similaris*, Fer., with respect to which it may here be remarked, that its most variable and dissimilar forms, are not those most widely dissociated in space, as might be surmised from the Darwinian explanation for such variations, as its local Indian forms more widely differ from the type and from one another, than individuals from the far off Mauritius and the Brazils.

#### HELIX SIMILARIS, Fér.

At the head of the varieties, as I regard them, of this species, I place *H. scalpturita*, B. This form inhabits the Irawadi valley above the British frontier, and is a stout well marked shell passing by degrees into *H. Zoroaster*, Th., though in this case as in others, the intermediate forms are usually scarceer individually and more variable than the types they tend to unite. Allied to some extent, but not very closely, is *H. Peguensis*, B., from I believe, the Eastern parts of Pegu. *H. Zoroaster* which is intimately related to *H. scalpturita* on the one hand and *H. similaris* on the other, occurs in tolerable number about Thait mio and the neighbourhood, and passes gradually into the type form of *H. similaris*. *H. pilidion*, B., is a thin-keeled shell related to *H. similaris*, from probably the same locality as *H. Peguensis*, and last comes the rotund, globular shell common about Thait mio, Prome, &c., described by Benson as *H. bolus*. Several intermediate gradations occur between *H. Zoroaster*, *H. bolus* and the type *H. similaris*, but not sufficiently marked to require special enumeration; the whole may thus naturally be arranged as below, those marked thus \* being aberrant, the forms required to connect them more closely, having probably to be discovered.

|                            |                               |
|----------------------------|-------------------------------|
| <i>H. scalpturita</i> , B. | Ava.                          |
| <i>H. Peguensis</i> , B.*  |                               |
| <i>H. Zoroaster</i> , Th.  | Thait mio, Prome, &c.         |
| <i>H. pilidion</i> , B.*   |                               |
| <i>H. similaris</i> , Fér. | Thait mio, Bengal, Mauritius. |
| <i>H. bolus</i> , B.       | Thait mio, Prome, &c.         |
| <i>H. cestus</i> , B.*     | Khasi hills.                  |



Of *H. cestus* I have but three individuals, but they seem to form merely a well marked local type of the species under consideration. They occur with or without the band; the two varieties differing slightly in other respects as well; somewhat as *H. Peguensis* does from *H. sculpturita*, the bandless variety of which it much resembles.

*H. ROTATORIA*, V. dem Busch.

This species, though affording strongly marked varieties, is not a variable one individually. We have in Burma the larger and more common form of seventeen millimeters, which varies very slightly, and a smaller form (*H. Arakanensis*, Th.) of only thirteen millimeters, with a higher spire, which also varies very little; and evidently connects the species with *H. Huttoni*, the largest specimen of which from India in my possession is also thirteen millimeters, but with a flatter spire than the small var. of *H. rotatoria*. There is also the very variable race of *H. Akowktongensis*, Th., with its usually flattened spire, holding a place between the large and small forms of *H. rotatoria*.

*H. tapeina* and *H. Phayrei*, Th. also claim a place near the type of the species, the first nearly equalling a large *H. rotatoria* in size, whilst closely resembling a small one in form, and the second differing from the type *rotatoria*, in its narrower umbilicus, and more strongly marked sculpture. The little Indian *H. Huttoni* follows, chiefly differing in its small size, which may be averaged at eleven millimeters.

Most aberrant of all comes *H. Oldhami*, B. with its depressed spire, but it hardly differs more widely (save in one extra whorl), from a large *rotatoria* in form, than specimens of *H. Akowktongensis*, Th. do from one another. Intermediate forms are, however, requisite to connect *H. Oldhami*, B. as closely as the rest are.

*H. rotatoria*, V. d. Busch. Irawadi valley, below the frontier.

*H. tapeina*, B. Khasi Hills.

*H. Phayrei*, Th. Irawadi valley, above the frontier.

*H. Arakanensis*, Th. Arakan hills and Irawadi valley.

*H. Akowktongensis*, Th. Irawadi valley.

*H. Huttoni*, B. Himalayas, Southern India.

*H. Oldhami*, B.\* Irawadi valley, above the frontier

*HELIX FALLACIOSA*, Fer., is another variable shell, presenting three distinct types, as *H. asprella*, Pf. and its allied forms *H. Nagporensis*, Pfr. and *H. propinqua*, Pfr. *H. fallaciosa*, Fér., with its varieties and ally *H. Helferi*, B. and *H. ruginosa*, Fér. with its ally *H. crassicostrata*, B.

The whole are so closely united as to be separable only one from another by the most arbitrary division. They may naturally be ranged thus:—

|                      |   |                                                      |                        |
|----------------------|---|------------------------------------------------------|------------------------|
| C.A.M.E.N.A. Albers. | { | <i>H. Nagporensis</i> , Pfr.                         | Central India.         |
|                      |   | <i>H. uncinata</i> , B. ( <i>H. propinqua</i> , Pfr. | Central India, Bombay. |
|                      |   | <i>H. asperella</i> , Pfr.                           | Central India.         |
|                      |   | <i>H. fallaciosa</i> , Fér.                          | Ceylon, South India.   |
|                      |   | <i>H. ruginosa</i> , Fér.                            | Southern India.        |
|                      |   | <i>H. crassicostata</i> , B.                         | Salem (?).             |
|                      |   | <i>H. Helfereri</i> , B.                             | Andamans.              |

*H. CLIMACTERICA*, B. No one on first examining a type-specimen of this shell of twenty-one mills. in diameter, would imagine there was any Indian shell very closely connected with it, but on examination of the small variety of from thirteen to fifteen mills., (for which I propose the term *H. geiton*, “γεῖτον”) a close relation is perceptible between it and *H. pansa*, B. on the one side and *H. ornatissima* on the other. The type form of *H. climacterica* is very peculiar, and is seen also in the smaller *H. geiton*, but in this last it is more subject to variation, so that some specimens are not much more keeled than *H. pansa*, B. whilst others unite this extreme form with the type. The main distinction seems to be, a more closed umbilicus in *H. climacterica*, than is observable in the others; a stouter shell more strongly keeled and more deeply sculptured. *H. ornatissima* whilst closely resembling the type as regards sculpture, departs from it in being less keeled, and in its umbilicus being more open, whilst *H. pansa*, B. is usually far less strongly sculptured than the type and thinner, but is more keeled and has a closer umbilicus than *H. ornatissima*. *H. anopleuris*, B. is merely a stout handsome *H. ornatissima*, on a large scale, ranging from fifteen to twenty-one mills. in diameter, my largest *H. ornatissima* being but sixteen mills. Intermediate forms there doubtless are, but the natural arrangement seems to be thus—

|                             |                                              |
|-----------------------------|----------------------------------------------|
| <i>H. climacterica</i> , B. | Khasi Hills.                                 |
| <i>H. geiton</i> , Th.      | Khasi Hills, (a dwarf <i>climacterica</i> ). |
| <i>H. pansa</i> , B.*       | Irawadi valley.                              |
| <i>H. ornatissima</i> , B.  | Darjiling.                                   |
| <i>H. anopleuris</i> , B.   | Hills North of Tirhoot (Soomeysur hill).     |
| <i>H. submissa</i> , B.*    | Ditto ditto.                                 |

An equal amount of variation in the keel may be often remarked

in *H. textrina*, B. some specimens of which in my possession are strongly keeled, whilst in others this character is nearly obsolete. Whatever may be thought however of my uniting such dissimilar shells as some of the above, better grounds exist for the union of some which now follow.

|                               |                           |
|-------------------------------|---------------------------|
| <i>H. infrendens</i> , Gould. | Farm caves near Maulmein. |
| <i>H. capescens</i> , B.      | Ditto.                    |
| <i>H. Tiekelli</i> , Th.      | Ditto.                    |
| <i>H. castra</i> , B.         | India, Birma.             |
| <i>H. sanis</i> , B.          | Andamans.                 |

which is I think merely a large depressed variety of *H. castra* of fifteen mills.

|                         |                            |
|-------------------------|----------------------------|
| <i>H. capitium</i> , B. | Tributary Mehals of Katak. |
| <i>H. hariola</i> , B.  | Pegu.                      |

I agree with Mr. W. T. Blanford in being unable to find any difference between the Katak shell and the keeled variety of *H. hariola* from Pegu, save a trifling superiority of size in the former.

|                |   |                                |                 |
|----------------|---|--------------------------------|-----------------|
| GALAXIAS Beck. | { | <i>H. Tranquebarica</i> , Fab. | Southern India. |
|                |   | <i>H. semirugata</i> , Beek.   | Ditto.          |
|                |   | <i>H. ligulata</i> , Fér.*     | Upper Bengal.   |
|                |   | <i>H. vitellina</i> , Pfr.     | Central India.  |
|                |   | <i>H. bullata</i> , Hutton.    | Ditto.          |

Of these shells, the two first are perhaps the least defined, and the whole have a tendency to pass into each other. *H. ligulata* is the well marked depressed form found in Bengal and *H. bullata*, H. of only nineteen mills in diameter, I have from Mhow. I shall now describe a few novelties which have lately occurred to me.

#### FAMILY ONCIDIADÆ.

##### VAGINULUS BIRMANICUS, H.

Corpore elongato, lævi, ante et pone eleganter rotundato, colore fusco, minutissime flavo maculato, subter albescente. Pede transversim rugoso, totius corporis longitudinis, sed vix ad quartam partem latitudinis attingente. Tentaculis quatuor; binis superioribus fuscis, oculiferis; inferioribus minus elongatis quamquam robustis, et papillam retractilem, sensu acutissimo præditam, subter gerentibus.

Habitat in locis humidis apud Rangoon, Pegu, Thait-mio, &c.  
Longitudine, 50 mills.

This slug is pretty common at Rangoon and is found harbouring under potsherds, bricks and rubbish in moist spots.

#### FAMILY LIMACIDÆ.

##### LIMAX VIRIDIS, Th.

Corpore expanso, pone acuminato, flavo cinereo. Pallio magno, læte colorato viridi-flavo limonis. Tentaculis superioribus, longis, pallidis, oculos parvos nigros gerentibus; et lineâ pallide smaragdina ad basin notatis. Tentaculis inferioribus minutissimis.

Habitat inter folia in dumetis marinis "mangrove" dictis apud littus Peguense, prope fines provinciæ Arracan.

This elegant little limax is very active and creeps about briskly on the green foliage of the salt swamps, which (*i. e.* the leaves) it resembles in colour.

In my last paper I included two limaces, *L. Memnon* and *L. Bengalensis* of which I unfortunately have no descriptions. The first is a large black slug from Hoshungabad, the other a small grey slug from Dinajpur.

#### HOPLITES.

This genus is formed for the reception of some large slugs, common at Teria Ghat near Sylhet. I have unfortunately no notes, but the animal is like *Vitrina* and closer perhaps to that group than to the slugs. It has a tough membranous plate on the centre of the back, conspicuous in the living animal, but no shelly plate. Its total length is about two inches.

#### FAMILY HELICIDÆ.

##### VITRINA PEGUENSIS, Th.

Animale pallide lutescente anteriori parte corporis virescente; posteriori tamen luteo-flavescente. Tentaculis superioribus longis et cum cervicæ virescentibus: inferioribus parvulis; Pallio granulato: cutis anserinæ modo; fuseo, testam omnino fere obtegente. Caudali papillâ nullâ. Longitudine 80 mills.

Testâ elongatâ, halitoideâ, politâ, subdiaphanâ; margine tenui, virescente; reliqua parte flavescente, et juxta apicem solidissimam albescente. Long. 15. Lat. 9. Alt. 4 mills. Habitat in humidis locis prope Pegu. This species belongs to the same section as *V. Gigas*, B. which it resembles in miniature and is remarkable for its very solid eslumella and apex.

## VITRINA CHRISTIANÆ, Th.

Testâ sub-globosâ, tenui, politâ, diaphanâ, nitidâ, supra costulate striatâ, infra planiore. Colore succineo. Apice pallido, vix elevatiusculo. Peripheriâ rotundatâ. Aperturâ parum obliquâ. Anfractibus  $3\frac{1}{2}$  lente crescentibus. Long. 13. Lat. 11. Alt. 3 mills.

Habitat in insulis Andamanicis.

I have much pleasure in naming this shell after the lady of the present Governor of the settlement, Lieut.-Col. Tytler, as a mark of esteem and in pleasing remembrance of my sojourn at Port Blair in his hospitable mansion. It is of the same type as *V. Bensoni*, Pfr. but is at once distinguished from all species I am acquainted with by its rich brown colour.

## HELIX EXUL, Th.

Testâ anguste umbilicatâ, depresso conoidea, lævi, tenui, striatulâ, concolore fuscâ. Apice obtuso. Anfractibus sex, tarde crescentibus, convexiuseulis, ultimo non descendente. Apertura obliquâ-Peristomate recto, tenui, juxta umbilicum leviter reflexo. Long. 16.5, Lat. 15, Alt. 8.5 mills. Habitat in insulis Andamanicis. This shell seems a *Nanina* and somewhat recalls *N. semifusca*, Dh. but is a more tumid species.

## STREPTAXIS BLANFORDI, Th.

Testâ perforatâ, depressâ, ovali-oblongâ, oblique costulatâ, striatâ, translucente; spirâ obtuse conoideâ. Anfractibus sesqui-quinque non angulatis. Aperturâ obliquâ, subquadrato-oblongâ: lamellâ parietali unâ et dente singulo in mediâ parte superioris marginis. Peristomate expanso, juxta umbilicum reflexiuseulo, marginibus callo tenui interdum junctis. Varietas reperitur dente carens. Long. 7.5 Lat. 5.0 Alt. 4.0 mills. Habitat montibus Arakanensibus provinciâ Pegu. *S. Andamanicæ*, B. peraffinis, sed differt dente marginali, apertura, et umbilico parum apertiore. Ab *S. Birmanica*, Bl. differt formâ minus globosâ, aperturâ et minore magnitudine.

## STREPTAXIS BIRMANICA. W. Blanford, (in MSS.).

Testâ perforatâ, ovali-oblongâ, depresse-globosâ, lævi, flavescente, diaphanâ, spirâ obtuse conoideâ. Anfractibus sex convexiuseulis, leviter costulate striatis; ultimo subter lævigato, et circum umbilicum compresse-angulato. Sutura profundâ. Aperturâ perobliquâ, subtriangulari-quadratâ. Dente parietali unico, magno, alteroque parvulo, in parte anteriori marginis superioris posito. Peristomate expanso, reflexiuseulo. Long. 9.0. Lat. 6.5. Alt. 5.0 mills. Varietas



minor invenitur dente marginali carens. Long. 8 mills. Habitat, Pegu. Var minor prope fontes fluminis, Pegu dicti.

A single specimen of this shell was received by me from Mr. W. T. Blanford, and I subsequently found two specimens of the smaller variety. It very closely approaches *S. Blanfordi*, Th. and *S. Andamanica*, but is not so depressed in form, and it differs from *S. Petiti* chiefly in its more triangularly quadrate mouth, marginal tooth and smaller size, (my largest, average, and smallest specimens of *S. Petiti* measuring in length respectively, 14.11 and 9 mills.).

The distinction however between these shells is only sufficient to constitute a well marked race. *S. Blanfordi*, Th. ranging with *S. Andamanica*, and *S. Birmanica*, Bl. with its ally *S. Petiti*.

#### CLAUSILIA MASONI, Th.

Testâ arcuato-rimatâ, fusiformi, tenui, costulate-striatâ, pallide castaneâ. Apice intacto. Sutura excavatâ. Anfractibus decem, sub-planatis, ultimo augustiore, supra aperturam fortiter striato, juxtaque suturam fossâ, laminæ interioris cursum monstrante, notato. Lunellâ distinctâ; interdum non. Lamellis quinque, duabus parietalibus tenuibus, distinctis, intus conniventibus; reliquorum binis fortibus ad aperturam divergentibus; tertiâ post lunellam valde tenui, inconspicuâ. Aperturâ rotundato-auriformi-solutâ. Peristomate expanso, reflexuseculo. Longitudinis 21 ad 29 mills. Latitudinis 4 ad 5 mills.

Habitat prope Tonghoo in montibus inter Provincias Pegu et Martaban.

This species varies somewhat in size and some specimens have a more slender spire than others. I have named it in compliment to the Rev. F. Mason, D.D., who kindly supplied me with specimens, and whose success, among the wild Karen tribes, will ever cause his name and that of his talented and energetic wife, to be enrolled in the foremost rank of missionary labourers in the East.

#### FAMILY CYCLOSTOMIDÆ.

##### CYCLOPHORUS ARTHRITICUS, Th.

Testâ umbilicatâ, turbinatâ, solidissimâ, striatâ, lineisque spiralibus flexuosis obscure decussatâ; sublævi, non politâ, fusecente castaneâ fasciâ latâ, albâ medianâ, interdum circumdatâ. Interdum colore omnino albâ, spira pallide castaneâ, et fascia parvâ castaneâ sub-mediana ornatâ. Anfractibus quinque convexis, haud tarde crescentibus; ulti-

mo valde capaci, rotundato. Aperturâ circulari. Peristomate expanso, reflexiuseulo, valde incrassato, continuo, intus flavo, interdum carulescente. Apice pallide purpurascente-rubicundula.

Long. 52, Lat. 39, Alt. 37 mills. Apertura 29 mills.

Habitat in collibus nemorosis circum fontes fluminis Pegu dicti. A very solid shell with the surface rarely in good condition and rather sparsely distributed. It is barely so globose as *C. flavilabris*, B. to which it is nearly allied, and from which it differs in sculpture, form and greater solidity.

With respect to *C. patens*, Bl. I find myself unable to regard it as a distinct species or even race, but merely as an individual variety of *C. fulguratus*, Pf. as I have no where observed it sufficiently numerous to be viewed in any other light. Another marked variety of *C. fulguratus* also occurs with a large thin shell and white or carulescent peristome, in some places not rarely: but it is clearly an individual variety of the predominant form. Both these varieties are good illustrations of how races originate, and [become?] eventually what most systematists would regard as distinct species; not as some would argue, by change effected by migration, or enforced to meet changed conditions of good climate or the like, but by individual aberration, and the coterporaneous up-growth of aberrant individuals into races and eventually species, as the Darwinian most correctly asserts: but not as far as I can see by any pressure of physical conditions co-relatively, as the Darwinian theory no less incorrectly argues. Some other principle, than of mere dependance on physical conditions, has yet to be discovered, before the problem of what governs variation, or in other words the "origin of species" can be regarded as satisfactorily solved.

PUPINA BLANFORDI, Th.

Testâ pupinæformi, politissimâ, flavescente-cornicâ. Anfraetibus quinque. Peristomate albo, non expanso. Canalibus albis. Long. 6, Diam 3.5 mills. Habitat, Pegu.

This species was forwarded to me by Mr. W. T. Blanford as a possible variety of *P. Peguensis*, B. It is intermediate in its characters and aspect, between *P. Peguensis*, B. and *P. artata*, B., to the latter of which it more closely approaches in the shape and unreflected form of its peristome. Whilst in fact *P. Blanfordi* ranks naturally as a near ally of *P. artata*, B., *P. Peguensis*, B. holds a similar relation to *P. arula*, B. and it is questionable if all four species will not prove to be

equally connected; *P. Peguensis* coming between *P. artata* and *P. arula*.

*P. Arula*, B. *P. Peguensis*, B. *P. Artata*, B. *P. Blanfordi*, Th.  
POMATIAS PEGUENSE, Th.

Testâ anguste sive obtecte umbilicatâ, turritâ, costulate striatâ, translucente, flavescente-cornéâ. Apice obtuso, lævi. Anfractibus septem sive octo, tumidis, lente crescentibus. Aperturâ sub-circulari. Peristomate duplici, extra brevissime expanso, intus continuo, crasso, juxta suturam leviter inciso. Operculo tenui corneo.

Long. 10. Lat. 3.5 mills. Apertura 2.5 mills.

Habitat in monte marmoreo, cavernoso, haud procul a Gwa, pago littore Peguensi.

This Pomatias is accompanied at the Limestone hill near Gwa by the following shells which I give to illustrate the range of some of them.

|                                             |                                       |
|---------------------------------------------|---------------------------------------|
| <i>Helix delibrata</i> , B.                 | <i>Cyclophorus Theobaldianus</i> , B. |
| <i>H. textrina</i> , B.                     | <i>Leptopoma aspirans</i> , B.        |
| <i>H. honesta</i> , Gould.                  | <i>Pupina artata</i> , B.             |
| <i>H. castra</i> , B.                       | <i>Alycaeus scepticus</i> , Bl.       |
| <i>H. rotatoria</i> , V. d. Busch. (small). | <i>Hydrocena pyxis</i> , B.           |
| <i>H. bascinnda</i> , B. var.               | <i>Diplommatina</i> .                 |
| <i>H. gratulans</i> , Bl.                   | <i>Helicina</i> .                     |
| <i>Plectopylis plectostoma</i> , B.         | <i>Pomatias Peguense</i> , Th.        |
| <i>Bulimus putus</i> , B. (slender var.)    |                                       |
| <i>B. gracilis</i> , Hutton.                |                                       |
| <i>Cryptosoma præstans</i> , Gould.         |                                       |
| <i>Streptaxis Burmanica</i> , Th.           |                                       |

The *Diplommatina* I have not made out, as I got no good specimens. The *Helicina* is very variable, and as I have no doubt *H. Andamanica*, B. but two distinct varieties occur, differing chiefly in size, and both smaller than the type, (as I regard it) from Port Blair, but as some of these shells may have been described before, I refrain from naming them. They are respectively five and six mills. diameter whilst the type measures eight mills. From the Andamans, however. I have a single small *Helicina*, smaller than either of those from the mainland, and I believe all four forms are merely races, all merging into each other, but my sole specimen has gone home to Mr. Benson, who, from its vast discrepancy in size from the type he is acquainted with, will probably regard it as a distinct species. *Haud ego.*



I cannot conclude this paper without offering a few remarks on the arrangement proposed by my friend, Mr. W. T. Blanford, for the Helicoidous groups in the Annals and Magazine of Natural History for February, 1863. The division of the whole, into two great GROUPS or SECTIONS,—A marked, by having the mucous pore at the truncate extremity with a superimpending lobe, and—B having the mucous pore in the elongated non-truncate extremity, devoid of an overhanging lobe,—is a natural and probably well marked one, but I think a still farther restriction of the term *Nanina*, than that Mr. Blanford has adopted, is called for in any natural classification.

We there find (*loc. cit.*) shells of two very naturally divided types all ranged together under *NANINA* or its subgenus *MACROCHLAMYS*, B. illustrated respectively by the species, *Vitrinoides, lubrica* and *petasus* on the one hand, and *pansa* and similar unpolished shells on the other. A more natural arrangement would surely be to restrict the term *Nanina* to these shells of the great Section A possessing a polished epidermis, of which *N. vitrinoides* may be regarded as the type, indicatory as such a condition of the surface usually is, of either lubricatory tentacular processes attached to the mouth, as in the type, or of close relations to the more typical species so provided.

This separation effected, the remainder form a natural group of which *pansa* may serve as a type, but want of all books of reference, prevents my offering any generic name, which a little research will soon supply. In this Section A, it may be remarked that Mr. Blanford includes *H. ligulata*, whilst *H. Tranquebarica* and its allies he ranges under Section B.

In the present paper I have included them, from a mere study of the shells, under one group, (*GALAXIAS*), which I should not have ventured to do in opposition to Mr. Blanford's observations, but for his remark on *H. ligulata*, which "*shows a passage into the other Section.*" It is therefore probably aberrant to some extent from *Tranquebarica*, but not more so perhaps than from the group with which Mr. Blanford has associated it. Mr. Blanford's remark on the similarity of the animals of *H. vittata*, Fér. and *H. fallaciosa*, Fér. is interesting, as a shell given to me by Mr. H. F. Blanford\* tends to connect

\* *H. proxima*, Fér. Besides the difference in form *H. proxima* has a white interior. *H. vittata* invariably brown or brownish black when adult. H. F. B.

these seeming dissimilar species. *H. vittata* is a very variable shell as the following measurements of specimens in my cabinet show.

A. 28 × 22 mills.

B. 24 × 18 „

C. 20 × 13 „ E. *H. fallaciosa* 14 × 6 mills.

D. 24 × 11 „

Specimens A, B and C of *H. vittata* are all from Ceylon.\*

A being a very elevated var, B a depressed var, and C the ordinary small var. D is the shell received from Mr. H. F. Blanford, and though white and more of the form of *H. fallaciosa* than of *H. vittata*, yet it must, I think, be classed as a variety or local race of the last. Numerically reduced the proportions are nearly thus—

A. = 15      B. = 10      C. = 6      D. = 6      E. = 2

So that if allowance is made for a better series of specimens from which measurements might be made, we see that individuals of the type shell A and C differ nearly as much from each other, as specimen E (*H. fallaciosa*) does from C. But this method of stating the relation, very inadequately represents it, D having the aspect and size of *H. vittata*, with the precise depressed form of *H. fallaciosa*, with whose colourless varieties it may be compared, as unlike *vittata*, it is colourless and white. It would be very curious if intermediate forms should eventually be discovered more closely connecting these at first sight utterly dissimilar species *H. vittata* and *H. fallaciosa*.

*Thaïet Mio, October, 1863.*

\* I may add to this list the extreme measurements of specimens in my own collection shewing still greater variability.

a                      b                      c

Diam. 17 m.m. 17 m.m. 29 m.m.

Alt. 18 m.m. 19 m.m. 22 m.m.

Specimen *a* is of uniform chestnut brown, *b* white with faint brown bands and violet apex, *c* white with flesh colored apex. H. F. B.

—————

*Errata in Mr. Theobald's paper, in No. 4 of 1863.*

| Page | line | for     | read     | Page | line | for         | read      |
|------|------|---------|----------|------|------|-------------|-----------|
| 354, | 2,   | leaning | bearing. | 370, | 12,  | Boriliæ     | Boutiæ.   |
| 355, | 26,  | living  | tiny.    | 375, | 14,  | Bensoni     | Barniana. |
| 358, | 7,   | focal   | wild.    | 376, | 28,  | After B add | sp.       |
| 367, | 32,  | bora    | vara.    | 381, | 10,  | etpilla     | rutella.  |

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On Ancient Indian Weights—By E. THOMAS, Esq.

[The subjoined article was sketched, with a view to the limited illustration of the subject announced in its title, for insertion in the *Numismatic Chronicle*: but so large a proportion of its contents have proved in the progress of the enquiry to relate to questions beyond the legitimate scope of that Journal, while they would seem well adapted for the pages of the *Journal of the Asiatic Society of Bengal*, that I have revised and added to the original paper, in the design of its simultaneous publication in England and in India. I am the more anxious that it should appear in the latter country, as there alone can its higher aims be suitably discussed; thence also must we seek a due definition of the indigenous plants upon whose products these weights are based, and a determination, by actual comparison of growing seeds, of the initiatory scheme of Indian Metrology. From that continent must come the further ethnological and philological evidence, which is to determine many of the questions I have ventured to raise. Wherever the final decision may be pronounced, it is clear the witnesses are still mainly in the land whose past history is under investigation.—EDWARD THOMAS].

The attention of archæologists has recently been attracted to the weights and measures of ancient nations, by the elaborate work of M. Queipo,¹ and the less voluminous, but more directly interesting article of Mr. R. S. Poole, on the Babylonian and other early metrologies.² At the present day, when ethnological inquiries engross such an unprecedented share of public notice, any parallel study that may contribute by material and tangible evidence to check erroneous, or suitably aid and uphold sound theories, should be freely welcomed, however much its details may threaten to prove tedious, or the locality whence its data are drawn may be removed beyond the more favoured circles of research.

The system of Indian weights, in its local development, though necessarily possessing a minor claim upon the consideration of the European world, may well maintain a leading position in the general

1. "Essai sur les Systèmes Métriques et Monétaires des Anciens Peuples," par Don V. Queipo, 3 vols. 8vo., Paris, 1859. See also a review of the same, *Journal des Savants*, 1861, p. 229.

2. Article "Weights," Smith's "Dictionary of the Bible," London, 1863.

investigation, on the ground of its primitive and independent organisation, and the very ancient date at which its terms were embodied and defined in writing; while to numismatists it offers the exceptional interest of possessing extant equivalents of the specified weights given in the archaic documentary record which Sanskrit literature, under the regained faculty of interpretation acquired by Western scholars, proves to have preserved in the text of the original code of Hindu law; as professedly expounded by Manu, and incorporated in the "Mánava Dharma Sástra." The positive epoch of this work is undetermined: but it confessedly represents, in its precepts, a state of society considerably anterior to the ultimate date of their collection and committal to writing;³ while the body of the compilation is assigned, on speculative⁴ grounds, to from B. C. 1280 to B. C. 880.

It is a singular and highly suggestive fact that numismatic testimony should have already taught us to look for the site of the chief seat of ancient civilisation in northern India, to the westward of the upper Jumna—a tract, for ages past, relatively impoverished. For such a deduction we have now indirect, but not the less valuable, historical authority, derived in parallel coincidence from the comparative geography of the Vedic period, and from the verbatim text of Manu, the integrity of which seems, for the major part, to have been scrupulously preserved.

3. I trust that European scholars will not imagine that I desire to ignore Megasthenes' statement, that the Indians had "no written laws." (Strabo, xv. c. i. § 53.) This is, indeed, precisely the testimony—seeing the source from whence it was derived—we should expect from what we now know of Brahmanical policy. As to the addition "who are ignorant even of writing," this ridiculous assertion had previously been nullified by the more accurate information of Nearehus (Strabo, xv. c. i. § 67), and is further conclusively refuted by the incidental evidence contained in the remarkable passage in the same work, where it is stated, "At the beginning of the new year all the philosophers repair to the king at the gate, and anything useful which they have committed to writing, or observed tending to improve the productions of the earth, &c. &c. &c., is then publicly declared." (xv. c. i. § 39).

4. Max Muller's "Sanskrit Literature," pp. 61, 62. "The code of Manu is almost the only work in Sanskrit literature which has as yet not been assailed by those who doubt the antiquity of everything Indian."

Professor H. H. Wilson, though hesitating to admit the high antiquity of the entire bulk of the composition, was fully prepared to assign many passages to a date "at least" as early as 800 B.C.—Prinsep's "Essays," i, note, p. 222. See also Professor Wilson's translation of the "Rig Veda Sanhitá," i. p. xlvi.

M. Vivien de St. Martin places Manu under "la période des temps héroïques," *i. e.*, between the twelfth and thirteenth centuries B. C., and the Buddhist epoch B. C., 543.—"Étude sur la Géographie et les Populations primitives de l'Inde," Paris, 1859.

The most prolific field among the favoured resorts of our native coin-collectors, in olden time, chanced to be the exact section of the country constituting the *Brahmāvarta* of the Hindu lawgiver; and *Thaneswar*—since so celebrated in the annals of the land, as the battle-field of successive contending hosts—contributed, at its local fairs, many of the choicest specimens of the inceptive currencies. In this region the Aryans appear to have almost lost their separate identity, and to have commenced the transitional process of merging their ethnic individuality amid the resident population, though still asserting religious and incidentally political supremacy. Such a state of things seems vividly shadowed forth in the ethnological definitions preserved in *Manu*; and it may possibly prove to be more than a mere coincidence, that the geographical distribution of the limits of "*Brahmarshi*, as distinguished from *Brahmāvarta*," in the same passage, should so nearly be identical with the general boundaries I have already traced, from independent sources, for the spread of the Bactrian alphabet in its Southern course.

I reproduce my latest observations on this subject.

"The Bactrian, Arian, or Arianian alphabet, unlike its southern contemporary, the Indian Pali, has no pretension whatever to an indigenous origination; it would seem to have accompanied or followed, in its archaic and imperfect form, the Aryan immigration from Media, based as it manifestly is upon an alphabet cognate with the Phœnician. We are unable to trace its progressive adaptation from the scanty literal signs of early Semitic writing; as we first find it, in an advanced stage of maturation, in an inscription on the Kapurdigiri rock in the Pesháwar valley (lat. 34° 20', long. 72° 12'), where it embodies the substance of the edicts of Asoka, whose corresponding manifestoes in the Indian-Páli character are so largely distributed over the continent of India,⁵ and the general date of whose incision may be approximatively fixed at 246 B.C.⁶ How much further south this character may have penetrated at this period we have no direct evidence to show, but it is to be remarked that the same king Asoka simultaneously retains the Indian proper alphabet in his monumental inscriptions at Khizrabad⁷ and at Khalsi,⁸ near the *débouchement*

5. Rock Inscriptions:—1. Girnár, in Guzerat. 2. Khalsi, on the Upper Jumna. 3. Dhauli, in Cuttack. 4. Naugam, in Ganjam. 5. Rhabra, in Jaipur.

Monolithic inscriptions:—1. Khizrabad, on the Upper Jumna. 2. Meerut (both moved to Delhi). 3. Allahábád. 4. Rádhia, in Sárun. 5. Mattiah, in the same locality.

6. "Journ. Royal Asiatic Soc.," xx. 101; "Prinsep's Essays," ii. 15, *et seq.*

7. "Prinsep's Essays," ii. 324.

8. "Journ. As. Soc. Bengal," 1862, p. 99.

of the Jumna from the Himalaya range; while the employment of the latter character by Agathoclos and Pantaleon would imply its currency within, or proximately south of the province of Arachosia. Then again, certain coins of a kingdom on the Upper Jumna, pertaining to a native dynasty of indeterminate date,⁹ but whose epoch may not be very distantly removed from the period under review, are found to be inscribed with the Arian character on the obverse surface, with a corresponding legend in Indian-Pāli on the reverse. In this instance also, the internal evidence would seem to show that the latter was the alphabet of the mint artificers, while the former may reasonably be supposed to have constituted the official writing of the ruling classes. Under this view, it may be conjectured that the Arian palæography encroached upon and intermingled with the indigenous system of letters as the dominant Northern races extended their dominions, in successive waves, further into Hindustan, till the intrusive alphabet reached Mathura, (lat. 27° 30', long. 77° 45'), which is the lowest point at which any indications of its progress are to be found.¹⁰ Whence, however, it was speedily to be thrown back, and very shortly superseded and extinguished by its more flexible and congruous associate of indigenous growth." (Numismatic Chronicle, 1863, p. 230.¹¹)

As I have claimed for the Pre-Aryan Indians the independent development of an alphabet specially contrived for, and adapted to, their

9. "Coins of Knanda, "Ariana Antiqua," pl. xv. fig. 23; "Prinsep's Essays," i. pl. iv. fig. 1 p. 203; *Ibid.*, ii. p. lxxix. fig. 16.

10. Mathura *Inscription*, dated in Bactrian figures, "Journ. As. Soc. Bengal," 1861, p. 427; *Coins*, Prinsep's Essays," ii. 197.

11. I recapitulate the leading inscriptions in this alphabet:—1. Hidda (No. 13), near Jellalabad, in Afghanistan. An earthen jar, having an Arian inscription, written *in ink*, and dated in the year 8. "Ariana Antiqua," p. 111, and plate, p. 262. 2. A steatite vase from Bimirān (Jellalabad), with a legend *scratched* on its surface, undated. "Ariana Antiqua," pp. 52, 70, pl. ii. fig. 1; "Prinsep's Essays," i. 107, pl. vi. 3. The Wardak (30 miles W. of Kabul) Brass Vase, now in the India Museum, inscribed with dotted letters, dated in the year 51, and recording the name of Hushka, the OOHPKI of the coins; see "Ariana Antiqua," p. 118; "Prinsep," i. 104, pl. x; "Journ. As. Soc. Bengal," No. iv. of 1861; "Journ. Royal As. Soc.," xx. 37. The Taxila Plate, dated 78, records the name of "Moga," identified with the Moa of the coins; "Num. Chron.," Bactrian List, No. xxv. 5. Manikyala Stone Slab (now in the Bibliothèque Impériale, Paris), dated in the year 18, contains the designation of Kanishka; "Prinsep's Essays," i. pl. ix.; "Journ. Royal As. Soc.," xx. 251. From the same site was obtained the Brass Cylinder now in the British Museum; "Prinsep," pl. vi. To these may be added two inscriptions from the Yusufzai country, one dated 60; "Journ. As. Soc. Bengal," 1854, p. 705; "Prinsep," i. pl. ix.; and the bi-literal inscription at Kangra (Arian and Indo-Pāli), "Prinsep," i. 159, pl. ix.

[The mention of OOHPKI reminds me, that Gen. Cunningham has complained in our Journal, of my having given the credit of the identification of that name with *Hushka*, to another. I have already taken the very earliest opportunity of correcting this unintentional error (Journal Asiatique. Octobre 1863. p. 387.) I availed myself of the same occasion, to express my regret that I, myself, had

own lingual requirements,¹² similarly it can be shown, from as valid internal indications, that they originated, altogether on their own soil, that which has so often proved a nation's unassailable heritage of its indigenous civilisation—a system of weights and measures, which retained its primitive identity in the presence of the dominant exotic nationality. It is indisputable that the intrusive Aryans, at whatever period their advent is to be placed, met and encountered a people, already dwelling in the land, of far higher domestic civilisation and material culture than themselves. Whether their eventual supremacy was due to undiminished northern energy, animal physique, or mental subtlety, does not concern us at present; but independent of the inner-life evidences to that effect, a parallel inference might be drawn from the indirect data of the contrasted tenor of the hymns of the Rig Veda,¹³ which while indicating a crude social condition, refer almost exclusively to the country of the Seven Rivers; whereas Manu, at a date but moderately subsequent,¹⁴ associates the far higher progress manifested in the body of the work with a more easterly seat of authority, and while asserting no community with things or people beyond or to the westward of the Saraswati, arrogates for the existing representatives of the Aryans a dominance over kindred kingdoms extending, in the opposite direction, down the Ganges to Kanauj. But, in demanding credence for the simple gift of invention arising out of manifest wants among the already thrice commixed, and in so

failed to do homage for a rectification of his, to which, he, I understand, attaches somewhat of undue importance, that is to say, the substitution of an M. in the place of Prinsep's P, as the third consonant in the name of Toramana (J. A. S. B. vii. 633). It might have been necessary, in early days, to reclaim titles to discoveries made by Lieut. A. Cunningham, (J. A. S. B. 1854, p. 714.) but surely the 'Bays' of the Archæological Surveyor to the Govt. of India can afford to lose a faded leaf with scant damage to the green circlet!]

12. Prinsep's "Essays," London, 1858, ii. 43; Num. Chron., 1863, p. 226.

13. Wilson, "Rig Veda Sanhitā," iii. pp. xviii. xix., London, 1857; Vivien St. Martin, "Étude sur la Géographie * * * d'après les Hymnes Védiques," Paris, 1859, p. 89.

14. "Journal As. Soc. Bengal," 1862, p. 49; Max Müller's "Rig Veda," preface to text, iv. pp. xxv.—xxxiv. "The traditional position of the solstitial points, as recorded in the Jyotisha," is calculated by Archdeacon Pratt to refer to 1181 B.C., and by the Rev. R. Main to 1186 B.C. See also p. lxxxvii. on the subject of Bentley's date, 1424—5 B.C.

For speculative dates concerning the Vedas, see also Max Müller, "Sanskrit Lit." pp. 244, 300, &c.; Wilson, "Rig Veda," i. 47, ii. 1; St. Martin, p. xix.; M. Barthélemy St. Hilaire, *Journal des Savants*, 1861, p. 53; Dr. Martin Haug, "Aitareya Brâhmana," Bombay, 1863; Goldstücker, "Pânini," p. 72, &c.

far improved¹⁵ local inhabitants, as opposed to the Aryan assumption of the introduction of all knowledge, I am by no means prepared to contend that the domiciled races gained nothing in return. The very contact of independently-wrought civilisations, to whatever point each had progressed, could not fail mutually to advantage both one and the other; the question to be asked is, which of the two was best prepared to receive new lights, and to utilise and incorporate the incidental advantages within their own body politic? The obvious result in this case, though denoting the surrender by one nation of all their marked individuality, by no means implies that they did not carry with them their influence, and a powerful one moreover, and affect materially the character of the people among whom, at the end of their wanderings, they introduced a priestly absolutism, which has progressively grown and increased rather than lost power till very recently over all India.

But here again a most important query forces itself upon our consideration. The Aryans are acknowledged to have been in a very barbarous state on their first entry into the land of the *Sapta Sindhu*.¹⁶ It is not known how long a period they consumed in traversing six out of the seven streams, or what opportunities may have been afforded for social improvement during the movement; but even by their own showing in the sacred hymns of the Rig Veda, the Aryans, when they had reached the banks of the Śaraswati, were still but very imperfectly civilised. The *Dasyus*, or indigenous races, with whom they came in contact in the Punjab, may well also have been in a comparatively undeveloped stage of national progress; while the inhabitants of the kingdoms on the Jumna seem to have been far advanced in civil and political refinement.¹⁷ Is it not, therefore, possible,

15. "We have therefore, according to the views just summarily expounded, four separate strata, so to speak, of the population in India:—1. The forest tribes . . . who may have entered India from the north-east. 2. The Dravidians, who entered India from the north-west . . . 3. The race of Scythian or non-Aryan immigrants from the north-west, whose language afterwards united with the Sanskrit to form the Prakrit dialects of Northern India. 4. The Aryan invaders." . . .—Muir's "Sanskrit Texts," ii. p. 487. See also Caldwell's "Dravidian Grammar."

16. St. Martin, p. 91.

17. Professor Wilson while speaking of the ultimate self-development of the Aryans in the Punjab, remarks, "It [is] indisputable that the Hindus of the Vaidik era had attained to an advanced stage of civilisation, little, if at all, dif-

if not probable, that when the Aryan flint, at the end of its course, struck against the Indian steel, sparks were emitted that flashed brightly on the cultivated intellects of a fixed and now thoroughly organised and homogeneous nation, whose leading spirits quickly saw and appreciated the opportunity afforded in the suggestion of a new religion, that was capable of being evolved, by judicious treatment, out of the rude elemental worship, aided forcibly by the mystification of the exotic and clearly superior language of the Aryans, which came so opportunely in company?¹⁸ The narrow geographical strip, to which the promoters of this creed confined the already arrogant priestly element, intervening between the two nationalities, would seem to savour more of an esoteric intention than of any natural result of conquest or of progressive power, achieved by the settlement of an intellectually higher class. That the Aryans should be able so completely to divest themselves of their national entity and leave no trace behind them, would be singular in itself; but the concentration of all god-like properties on a mere boundary line, so much insisted upon as Brahmanism grew and pushed its forces downwards into the richer countries of Hindustan, while it ignored both the land of the nativity of its votaries and the site of their later more advantageous domestication, forms a fair subject for present speculation and future deliberate investigation. But this in itself is a matter only incidental to my special subject, and I return to the question, that if the Aryans were so far instructed on their first immigration as to bring with them, or subsequently to import and amplify, the Phœnician alphabet, and similarly to secure its transmission, even as a secondary system of

fering from that in which they were found by the Greeks at Alexander's invasion, although no doubt they had not spread so far to the east, and were located chiefly in the Punjáb and along the Indus."—"Rig. Veda," ii. p. xvii. I am inclined to question this latter inference; I do not think the civilisation evidenced in the text of the "Rig Veda" by any means equal to that discovered at the advent of the Greeks; indeed, it would be an anomaly that the Aryans, while occupied in pressing their way onwards, in constant hostility with the local tribes, should have made a proportionately greater progress in national culture than they did in the subsequent six or seven centuries of fixed residence in their new home within the five rivers.

18. A late writer in the *Westminster Review* 1864, p. 154, has justly remarked that the 1026 incoherent hymns of the "Rig Veda" constituted but a poor stock in trade whereon to found a new religion. Nor do the Soma "inspired" Rishis by whom they were "seen" appear, from the internal evidence of their crude chants, to have possessed mental qualifications such as should have been equal to the origination of the higher intellectual structure of Brahmanism.

writing, over all the country of the *Brahmarshis*, it would be rash to attempt to place a limit on the amount of Chaldæan or other western sciences that may have accompanied these cursive letters,¹⁹ which, either directly or indirectly, travelled eastward from the borders of Mesopotamia to the banks of the Ganges. And clearly, if the grammarian *Pāṇini's* age has been rightly determined by his special modern commentator,²⁰ Bactrian writing, or *Yavanāni-lipi*,²¹ must have been freely current at Taxila at and before B.C. 543, even as it subsequently became the ruling alphabet in those parts, so as to appear as the Inscription character under Asoka (B.C. 246) in the Peshāwar valley, and to hold its own as the official method of expression in concurrence with the local Pāli as low down as Mathura up to a much later period. Under these evidences of the spread of Aryan civilisation in India, there will be little or no difficulty in admitting that much of what has hitherto been esteemed as purely indigenous knowledge, may, even thus early, have been improved and matured by the waifs and strays of the discoveries of very distant nations, without in any way detracting from or depreciating the independent originality of local thought, or the true marvels India achieved unaided by foreign teaching.

In illustration of the preceding remarks, and as the necessary definition of the boundaries of the kingdom to which our initial series of coins refer, I transcribe in full a translation of the original passage from Manu.

Manu, ii., 17.²² "Between the two divine rivers, SARASWATI and DRISHADWATI [Chitang], lies the tract of land which the sages have named BRAHMA'VARTA,

19. We have indirect evidence to show that this style of writing was in very early currency in association with the monumental cuneiform. I assume that wherever, in the ancient sculptures, we see two scribes employed—the one using a style and marking a clay tablet, the other writing upon a flexible substance—the latter is using cursive Babylonian, or what has since been conventionally recognised as Phœnician. M. E. Renan considers it is satisfactorily established, that the Jews used "phénico-babylonien" letters, at their coming out of Egypt, now placed in B. C. 1312. Renan, 'Langues Sémitiques,' pp. 108, 216, &c. Prinsep's Essays, ii. 145.

20. Goldstücker, "*Pāṇini*, his place in Sanskrit Literature," London, 1861, pp. 12, 227; so also Alwis, "*Pāli Grammar*," Colombo, 1863, p. xli.; and Colebrooke's "*Misc. Essays*," ii. p. 4.

21. Max Müller, "*Sanskrit Lit.*," London, 1859, p. 521; and preface to text of "*Rig Veda*," London, 1862, vol. iv. p. lxxiv.

22. Sir W. Jones's works, London, 1799, vol. iii.; Haughton, "*Hindu Law*," p. 22.

land was frequented by gods.²³ 18. The custom preserved by immemorial tradition in that country, among the four *pure* classes, and among those which are mixed, is called approved usage. 19. KURUKSHETRA [modern Dehli], MATSYA [on the Jumna], PANCHÁLA [*Kanyakubja, Kanauj*], and SURASENA [or Mathurá], form the region called BRAHMARSHI, distinguished from BRAHMA'VARTA. 20. From a *Bráhman* who was born in that country, let all men on earth learn their several usages. 21. That country which lies between HIMAWAT and VINDHYA, to the east of VINASANA [where the Sarasvati disappears in the desert²⁴] and to the west of PRAYA'GA [Allahabad], is celebrated by the title of MADHYADESA [or the central region]. 22. As far as the eastern and as far as the western oceans, between the two mountains just mentioned, lies the tract which the wise have named ARYA'VARTA [or *inhabited by respectable men*]. 23. That land on which the black antelope naturally grazes is held fit for the performance of sacrifices; but the land of MLECHHAS [or *those who speak barbarously*] differs widely from it. 24. Let the three first classes invariably dwell in those before-mentioned countries; but a ŚÚDRA, distressed for subsistence, may sojourn wherever he chooses."²⁵

It is reasonable to infer that, as a general rule, all schemes of weights among an isolated people, initiating their own social laws, should preferably be based upon some obvious unit of universal access, rather than upon any higher measure of weight, which might naturally result, under authoritative legislation, from progressive increments on the lower basis. So that, in testing the intentional ratios of early times by the extant money designed in accordance with the contemporaneous tables, it will be safer to proceed from the lowest tangible limit of the scale, in preference to accepting any superior denomination as a standard whence to reduce, by division, the component elements involved. The intuitive unit of weight, among an imperfectly formed agricultural community, would naturally be the most generally

23. For the comparative geography of this tract, see *Journal As. Soc. Bengal*, ii. 106. Major Colvin, vii. 752. ix. 688. Lt. Baker, xiii. 297. Major Mackeson. Elliot's *Glossary of Indian Terms*, p. 78.

24. Muir, "*Śanskrit Texts*," ii. pp. 415—418. Wilson, *Rig Veda Sanhitá* iii. pp. xviii.—xix. St. Martin pp. 15, 73.

25. Mr. Muir has given us a new translation of this celebrated passage, which, as it differs from the above in the introductory portion, I annex in a separate note.

"The tract, fashioned by the gods, which lies between the two divine rivers, Sarasvatí and Ārishadvatí, is called Brahmávartha. The usage relating to castes and mixed castes, which has been traditionally received in that country, is called the pure usage. The country of Kurukshetra (in the region of modern Delhi), and of the Matsyas (on the Jumna), Panchálas (in the vicinity of modern Kanauj) and Súrásenas (in the district of Mathurá), which adjoins Brahmávartha, is the land of the Bráhmashis (divine Rishis)." — "*Sanskrit Texts*," ii. p. 417.

available and comparatively equable product of nature; in the *form of seeds* of cultivated or other indigenous plants; and in the Indian instance we find, after some definitions of inappreciable lower quantities, the scale commencing with a minute poppy seed, passing on to the several varieties of black and white mustard seed, barley-corns, and centering in that peculiarly Indian product, the *Rati*, or seed of the wild Gunja creeper, *Abrus precatorius* [Sanskrit, *Krishnala* or *Raktika*], which forms the basis of all local weights, and whose representatives of modern growth still retain their position as adjuncts to every goldsmith's and money-changer's scales. Next to the rati in ascending order comes the *Másha*, which in its universal acceptance has almost achieved the title to be considered as a second unit or ponderable standard, and, as such, its name now primarily signifies "an elementary weight;"²⁶ but on reverting to its earlier equivalent meanings it would seem that the term, in its original static sense, like the whole of the weights hitherto quoted, referred to another of Nature's gifts, the seed of the Indian-bean (*Phaseolus radiatus*, ماش هندي),²⁷ which, like the rati, claims especially an Indian habitat as an extensively cultivated plant; and, to complete their associate identities, the bean as at present raised would seem to correspond with the weight assigned to it nearly 3,000 years ago, and to average about the amount of five ratis. The next advance upon the másha is, in the gold table, a *suvarna*, a word meaning *gold* itself, and which probably implies in this case the particular divisional quantity of that metal which in earlier times constituted the conventional piece or lump current in commerce. While the silver increment on the másha is designated by the optional title of *purána*, or *old*, which may be supposed to allude to the, even then, recognition of this measure of value as emanating from high antiquity; and it is precisely the required amount in corresponding ratis of silver incorporated in the earliest extant prototype of coins I am now about to exhibit.²⁸ The

26. Wilson's "Glossary of Indian Terms," "Másha... an elementary weight in the system of goldsmiths' and jewellers' weights throughout India, and the basis of the weight of the current silver coin."

27. Wilson's "Sanskrit Dictionary," Calcutta, 1832, *sub voce*, "Masha."

28. J. A. S. B. iv. Plate xxxv. figs. 25—29. Prinsep's Essays, Pl. xx. figs. 25—29 and vol. i. pp. 53, 209, 211. Madras Journal of Lit. and Science, 1858, p. 220. Mr. W. Elliot. These pieces of metal, or "punch coins" as Prinsep named them, average about 52 grains. I have met with one as high as 54 gr. and Mr. W. Elliot gives one at 54.2 gr. Supposing an original Mint issue at 55 grains, the authorized

higher denomination of the silver *Satamána*²⁹ is also derived from the vegetable kingdom, but unlike the lower divisions, which are defined by single grains, this weight is produced by *one hundred* seeds of the *Alocasia Indica*. When the precise plant, which furnished the *Mána* seed for the early standard, is satisfactorily determined, the result will doubtless prove the near equivalent of 100 *Mánas* to 320 *Ratis*—which, it will be seen, comprised the identical amount required for the weight of the gold *Nishka*,³⁰ whose minor constituents are, however, formed upon a different gradational scale, though equally emanating from the conventional *Rati* unit. I need not follow the nomenclature of the larger divisions of weights in the joint tables, but before closing the inquiry I would revert for a moment to the leading point I desire to establish, that the Indians were not indebted to the Aryans for their system of weights; the latter, in fact, when tried by the test of the hymns of the “*Rig Veda*,” would seem to have been very ill versed in the *Flora Indica*, an extensive knowledge of which was clearly necessary for, and is evidenced in, the formation of the scale of proportions. Indeed, although the Vedic Aryans often invoked their gods to aid their agriculture, the result so little availed them that their efforts at cultivation were apparently confined to barley, in the raising of which even they do not seem to have been always successful.³¹

The next question to be examined is the distribution of the arithmetical numbers whereby the process of multiplication was conducted. Mr. Poole has laid it down as a law for Mesopotamian metrology that, “all the older systems are divisible by either 6,000 or 3,600. The 6,000th or 3,600th part of the talent is a divisor of all higher weights and coins, and a multiple of all lower weights and coins, except its $\frac{2}{3}$ rds.”³²

Rati of Manu’s time, would range at 1.71875 grains or allowing 56 grains for the standard, the return of the rati weight would be $56 \div 32 = 1.75$; an amount I am inclined to adopt upon other grounds. We must not be misled by the more modern weight the rati eventually attained, as it rose, in account, with the rise of *māshas* and *tolas*.

29. शत मान, Wilson makes it, शत 100, मान measure, See, however, B. मान S. मानक “*Arum Indicum*.” Carey, Hort. Ben, pp. 56. 65. Asiatic Res. x. 19. “*Mán Kachú*.” Dr. Thomson has sent me a seed of the WILD *Alocasia fallax*, from Khasia, which itself weighs $2\frac{1}{2}$ grains.

30. Nishka occurs in second Ashtaka of the Rig Veda. Wilson, ii. p. 17.

31. Wilson’s “*Rig Veda*,” i. pp. xli., lvii., and iii. p. xi.

32. Mr. Poole has favoured me with the subjoined revised list of ancient metric systems. —

The sixes and sixties of the banks of the Euphrates³³ find no counterpart to the southward of the Sewalik range beyond the inevitable ten and the included five. The system, like all else pertaining to it, had its own independently devised multiple, the *four*. Whether the first suggestion of this favourite number was derived from the four fingers of the hand, four-footed beasts, or the higher flight of the four elements, we need not pause to inquire, but the Indians have at all times displayed an unpreceded faculty for figures, and were from the first able to manipulate complicated arithmetical problems, and especially delighted in fabulous totals; but with all this they have ever evinced their allegiance to the old 4, which we find in its place of honour in the earliest extant writings and inscriptions. As the nations of the West, to meet their own wants, speedily produced a separate symbol for *five*,³⁴ and abbreviated the five perpendicular strokes of the Phœnician into <. The Indians, apart from their indigenous Páli signs for 4, simplified the tedious repetition of the four lines the Bactrian writing had brought with it from Mesopotamia into a cross like a Roman X, which was doubled to form eight, while they left the five utterly unearned for, to follow in a measure the original Phœnician method of

	Grains.	Divisional Scale.	Authoritative Unit.	Practical Unit. Coins.
Hebrew Gold (double)	1,320,000	÷ 100 ÷ 100 =	132 gr.	
" Silver	660,000	÷ 3000 ÷	= 220	220 shekel.
Babylonian (full)	959,040	+ 60 ÷ 120 =	133·2	[126·7] 84·5 siglos.
		or ÷ 60 ÷ 60 =	266·4	
" lesser	479,520	÷ 60 ÷ 60 =	133·2	
Persian Gold	399,600	÷ 3000	= 133·2	129 Daric.
Egyptian "	840,000	÷ 600 ÷ 10 =	140	140 Ke T.
Æginetan,	660,000	÷ 60 ÷ 100 =	110	110
Attic (commercial), ...	598,800	÷ 60 ÷ 100 =	99·8	
" (lowered),	558,900	÷ 60 ÷ 100 =	93·1	92·3
" (Solonian),	430,260	[÷ 120 ÷ 100 =	71·7]	67·5
" (ditto double), ...	860,520	÷ 60 ÷ 100 =	71·7	71·7
" (ditto lowered),	405,000	÷ 60 ÷ 100 =	67·5	
Euboë,	387,000	[÷ 6000	= 64·5]	57·0 denarius.

Egyptian Copper. A.	1400 gr. = 1 Men.	Hebrew Copper.	250 gr. = $\frac{1}{4}$
B.	700 " = 5 Ket.		125 " = $\frac{1}{8}$
C.	280 " = 2 "		83·3 " = $\frac{1}{6}$
D.	140 " = 1 "		
E.	70 " = $\frac{1}{2}$ "		

33. Sir H. Rawlinson, "Journal Royal Asiatic Society," xv. p. 217.

34. Gesenius, p. 88; M. Pihan, "Signes de Numération usités chez les Peuples Orientaux," Paris, 1860, p. 167.

IX, or 4 plus 1 = 5.³⁵ Of course the Indian table of weights had in practice to have its lower proportionate atoms accommodated to the weights actually pertaining to the seeds in each instance, but the higher gradations are uniformly grounded upon fours and tens; and to show how distinctly the idea of working by fours was fixed in the minds of men, we find the gradational system of fines in Manu (viii. 337) progressively stated as "8, 16, 32, 64." So much for the antiquarian evidences, and to prove the custom at the other extreme of the chain of testimony and its survival within a nation of almost Chinese fixity, it may be asserted that the whole vulgar arithmetic is primarily reckoned by *gandas* = "fours," and in the modern bazars of India the unlettered cultivator may frequently be seen having a complicated account demonstrated to him by the aid of a series of *fours*, represented, as the case may be, by cowrie-shells, or grains of pulse. I pass by other elements of calculation, such as the favourite 84 (7×12)³⁶ which might bring me into contest with the astronomers, and content myself with resting this portion of my case on the coincidences already cited, as I conclude the most ardent upholder of Aryan supremacy can hardly arrogate for that ethnic division of the human race any speciality in *fours*.³⁷

I now proceed to quote the passage from Manu defining the authorised weights and equivalents of gold and silver, which I have cast into a tabular form as more readily explanatory of the text, and as simplifying the reference to relative scales of proportion.

viii. 131. "Those names of copper, silver, and gold [weights] which are commonly used among men for the purpose of worldly business, I will now comprehensively explain. 132. The very small mote which may be discerned in a sunbeam passing through a lattice is the first of quantities, and men call it a *trasarenu*. 133. Eight of those *trasarenu*s are supposed equal in weight to one minute poppy-seed (*likhyá*) three of those seeds are equal to one black mustard-seed (*rája sarshapa*), and three of these last to a white mustard-seed (*gaura-sarshapa*). 134. Six white mustard-seeds are equal to a

35. "Journal Royal Asiatic Society," xix, p. 12.

36. See an admirable essay on this number, under the head of "Chourasee," in Sir H. M. Elliot's "Glossary of Indian Terms," Agra, 1845.

37. M. Pictet, who has so laboriously collected all and everything pertaining to the Aryans, in his "Paléontologie Linguistique," does not even notice the number!—"Les Origines Indo-européennes," Paris, 1863, p. 565.

middle-sized barley-corn (*yava*), three such barley-corns to one *krishnala* [*raktika*], five *krishnalas* of gold are one *másha*, and sixteen such *máshas* one *suvarna*. 135. Four *suvarnas* make a *pala*, ten *palas* a *dharana*, but two *krishnalas* weighed together are considered as one silver *máshaka*. 136. Sixteen of those *máshakas* are a silver *dharana*, or *purána*, but a copper *kársha* is known to be a *pana* or *kárshápana*. 137. Ten *dharanas* of silver are known by the name of a *satamána*, and the weight of four *suvarnas* has also the appellation of a *nishka*.³⁸

ANCIENT INDIAN SYSTEM OF WEIGHTS (from Mann, cap. viii. § 134).

SILVER.

2 ratis	=	1 másha.		
32 „	=	16 „	=	{ 1 dharana, or purána.
320 „	=	160 „	=	10 „ 1 satamána.

GOLD.

5 ratis	=	1 másha.		
80 „	=	16 „	=	1 suvarna.
320 „	=	64 „	=	4 „ = { 1 pala, or nishka.
3200 „	=	640 „	=	40 „ = 10 „ = 1 dharana.

COPPER.³⁹

Kárshápana.

As there are some obscurities in the detail of the weights given in Manu, I have referred to the next succeeding authority on Hindu law, the Dharma-Sástra of Yájnavalkya, whose date is variously attributed from a period shortly before Vikramáditya, or B.C. 57 to 50 A.D.⁴⁰ His tables are nearly identical with those already quoted,⁴¹ one un-

38. "Hindu Law, or the Ordinances of Manu," by G. C. Haughton, London, 1825, and works of Sir W. Jones, London, 1799, vol. iii. Haughton's translation has been modified as above by my friend, Mr. J. Muir.

39. Mr. Muir has communicated to me the following note on the copper weight. "Kullúka Bhatta (the Sanskrit Commentator on Manu) explains that lexicographers declare a *Kárshika* or *Kársha* to be the fourth of a *pala*." But 5 *Krishnalas* or *Raktikas* being equal to a *Másha* and 16 *máshas* = 1 *suvarna*, and 4 *suvarnas* = 1 *pala*; a *pala* will equal $5 \times 16 \times 4 = 320$ *krishnalas*, and a *kársha* being $\frac{1}{4}$ of a *pala*, will equal $\frac{320}{4} = 80$ *krishnalas*.

40. Lassen, "Ind. Alt.," ii. 374, 470, 510. Dr. Roer, "Yájnavalkya," Calcutta, 1859, p. 11; M. Müller, "Sanskrit Lit.," 330; Stentzler (2nd Cent. A.D.)

41. Sec. 632. Five *krishnala* berries = 1 *másha*, 16 *máshas* = 1 *suvarna*. Sec. 363. A *pala* is 4 or 5 *suvarnas*. Two *krishnalas* are a silver *másha*; 16 of the latter a *dharana*. Sec. 364. A *satamána* and a *pala* are each equal to 10 *dharanas*; a *nishka* is 4 *suvarnas*. * * * Note. In the corresponding *stokas* of Manu, 10 *palas* are said to be equivalent to 1 *dharana*. We can only reconcile this by supposing Manu to refer to a gold *pala*, and Yájnavalkya to a silver *pala*. The Sanskrit commentator adds, under *Copper*, 4 *kárshas* = *pala*, 1 *pana* = *kársha*, i. e. $\frac{1}{4}$ *pala*.

important but reasonable variant being the assignment of three white mustard seeds instead of six to the barley-corn. There are some apparent contradictions and complications regarding palas and suvarnas, and no additional information respecting the weight of the copper-measure of value, which is described in Dr. Roer's translation as vaguely as in Manu, "a copper pana is of the weight of a kârsha," and as the English commentator justly observes, the tables "by no means satisfactorily define the intrinsic weight and signification of the Pana, which as the measure of pecuniary penalty" would naturally be of the greatest importance. It is to be remarked that neither Manu nor Yájnavalkya refer in any way to the Cowrie shell currency, which was clearly in these days a seaboard circulation; nor is any mention made of the tola, which subsequently plays so leading a part in Indian metrology. So much for the weights and their relative proportions *inter se*. I shall defer any examination of the corresponding equivalents in the English standard till I can apply the results to the extant coins of the period.

Before taking leave of this division of the subject, I am anxious to meet, in anticipation, an objection which may possibly strike philologists as hostile to the general position I have sought to maintain in this paper; inasmuch as it may be held that the fact of the several divisions of the static tables being expressed in Sanskrit words, should, *primâ facie*, imply that the Sanskrit-speaking "Aryans" originated the system upon which the gradational scales were based. But it must be remembered that the entire work from whence these data are derived is written in the Sanskrit language, its very exotic character justifying the inference that it was so embodied, not with a view to vulgar use, but for the purposes of a superiorly educated or, more probably, of an exclusive class. Moreover, it is to be borne in mind that the speech itself, though foreign, had for many centuries been partially introduced into the land, and constituted the chosen means of expression of the dominant religious and occasional temporal authority. But apart from these considerations there remains to me the more comprehensive question as to how much of the Sanskrit tongue of our modern dictionaries, at this time undergoing the process of formation and maturation on Indian soil, was indebted to the local speech? It can be shown from sound palæographic, as well as from philological testimony, that the intermingling Aryans borrowed Drávidian letters to improve

their *then* imperfect alphabet,⁴² adopted Drávidian words till lately classed as Aryan,⁴³ and as we have seen, by the inherent evidence of the Bactrian character, appropriated a very large amount of Indian Páli design in the mechanical construction of the vocalic and other portions of their needfully amplified Semitic writing.⁴⁴

I had written thus far, with growing doubts about the universality of the Indo-Germanic speech in India, when it occurred to me to inquire if Drávidian roots might not throw light upon the clearly misunderstood meaning of the passage in Manu, defining the value of a copper *kárshápana*. The result has more than answered my expectations, as I find the Tamil *kásu*,⁴⁵ corruptly “*cash*,” described as “*coin, money in general*,” and among the details it is mentioned that *ponakásu*, *vennikásu*, and *pettalaikásu* still exist as the vernacular terms severally for gold, silver, and copper *coins*, while the corresponding verb *kásaḍikka* primarily means “*to coin*.” With these hints a new and intelligible translation of the verse कार्षापणमु विज्ञेय-
स्त्नाम्निकं कार्षिकः पणः may be proposed, to the effect that a “*kárshápana* is to be understood (to be) a *coined* copper *pana*.” If this interpretation will stand criticism, we have indeed the new phase of the Indian monetary system, that the earliest Sanskrit authority on such subjects extant, dating between 1280 and 880 B.C., recognises as an ordinary fact the institution of *coined* money, while the context proves how much of Drávidian civilisation still remained in the Upper Provinces, and how little competent subsequent Sanskrit commentators on Manu’s text were to appreciate anything beyond their own confined views and conventional teachings.

42. Norris, R. A. S., xv. p. 19. “The Scythic Version of the Behistun Inscription of Darius,” Caldwell, “Drávidian Grammar,” pp. 43, 107, 111; Prinsep’s “Essays,” ii. 151.

43. Caldwell, p. 438; Muir, “Sanskrit Texts,” ii. p. 440.

44. Num. Chron., 1863, p. 232; Prinsep’s “Essays,” ii. 146.

45. Wilson, “Glossary of Indian Terms,” *sub voce*.

On the Language of the Sí-áh-pos'h Káfirs, with a short list of words ; to which are added specimens of the Kohistání, and other dialects spoken on the northern border of Afghánistán, &c.—By Captain H. G. RAVERTY, 3rd Regiment, Bombay N. I.

In the beginning of the year 1859, some time after my paper entitled "NOTES ON KÁFIRISTÁN" had been submitted to the Society, but previous to its appearance in the Journal,* the Rev. Dr. E. Trumpp, of the Church Missionary Society, residing, at that time, within the cantonment of Pes'háwar, was allowed to examine, through the Commissioner of that district, three men, said to have been of the Káfir race—that is to say, what we call the Sí-áh-pos'h Káfirs—who had been brought to the district from Panj-korah or its neighbouring hilly tracts, for the purpose of being enlisted into the British service.

These three men remained at Pes'háwar for "a few days," during "three or four hours" of which Dr. Trumpp examined them, through a man named Muhammad Rasúl, a Kohistání of "Panjkore" as the Doctor terms it, but correctly, Panj-korah.† This man, who was not an Afghán, since the Doctor calls him a "Kúhistání," "spoke Pushto and a little Persian," and acted as interpreter between the Missionary and the so-called Káfirs; and from this short and round-about conference, a short grammar of the language has been made, and a list of seventy-seven Káfir words appended.

It is not my object to criticise the former at present, but to give a list of Káfir words, which I collected some years since, and which I intended to have given with my "Notes on Káfiristán." To these words, for the sake of facilitating comparison, I have also added some Kohistání words, which I collected about the same time, together with a few in the Pashai, Báarakai, Qás'h-қárir or Chitrálí, and Belúchki languages. I would have given the Pus'hto equivalents of these had space permitted, but they may be easily found in my Dictionary of the language, together with the other words, of which there are often more than one, bearing the same signification.

From what is stated respecting the appearance of these three men, that "they were in all respects like the natives of the upper provinces of India, of a swarthy colour, with dark hair and dark eyes," I should

* No. 4 of 1859.

† See my paper on Panj-korah in the last number of the Journal.

hardly think they were real Káfirs; and should consider that, in all probability, they were *nímchahs* (نیم‌چاه) or “half-breeds,” as those people are designated who have sprung from the mixture of Afgháns with the aborigines of the parts to the north of the Kábul river; viz. the Káfirs, Lamghánís, Shalmánís, Deggauns, Gújars, Suwátís, &c., and with each other; for the Afgháns, as we know from their histories, as well as from the accounts of Persian and Hindústání writers, have been in the habit of applying the Arabic term “Káfir,” or “Infidel” very indiscriminately, particularly to the aboriginal people of Afghánistán bordering upon the Kábul river and its tributaries, and the people of the Alpine Panjáb nearest the Indus. Hence, with them, the term Káfir might as well refer to the Lamghánís, or Shalmánís, before conversion to their own faith, as to the people whom we know by the name of *Sí-áh-pos'h* Káfirs. Lieut. Wood, when on his journey to the source of the Oxus, passed close to their frontier, and he, moreover, saw and conversed with *Sí-áh-pos'h* Káfirs (for they are friendly with the people of Bádakhshán), and he describes them as being very different to the “swarthy coloured people of the upper provinces of India, with dark hair and dark eyes,” such as Dr. Trumpp speaks of.* What makes me think that these three men could not have been real *Sí-áh-pos'h* Káfirs, is the fact of their having come to Pes'háwar otherwise than as slaves. Both males and females—the latter in particular, on account of their fair complexions and beauty—are to be found in the dwellings of the Afgháns of the better class, in the *Samáh* of the Yúsufzís, but they are always slaves; and some will be found in the Pes'háwar district also; but they are very different to those the Missionary describes. The *Sí-áh-pos'h* Káfirs, are too hostile to, and hate the Afgháns and other Muhammadans of those parts too much (except perhaps the people of Bádakhshán, as already mentioned), to meet them, or to enter their boundaries, save as enemies, or when, as slaves, they are compelled to do so. If these men were not actually *Nímchahs* or *Kohistánís*, of which, I have little doubt, they may possibly have been *Báris*—a certain class or tribe among the *Sí-áh-pos'h*, who are held in the light of *Páriahs*. An account of these will be found at page 36 of my “Notes on Káfiristán” already referred to; but if the *Kohistání* words I have given be ex-

* Dr. Bellew also met Káfirs when in Afghánistán in 1857. See his excellent work.

mined, and compared with the short list given by the Missionary, it will be found that what he terms Káfir, are the same words as my Kohistání, with but slight exception; whilst what I term Káfir agree with the list (as far as it goes) given by Sir A. Burnes in the Society's Journal for April 1838, and are synonymous with those given by Mr. Norris (the Honorary Secretary of the Royal Asiatic Society) as an appendix to Dr. Trumpp's paper,* which were procured at Teheran from a Káfir woman residing in that city.

The Doctor says he "was very desirous to know by what name they called their own country, as Káfiristán is a mere Muhamnadan appellation;" and that "the name they gave for their country was *Wámasthán*, a word, as I found, known to the Kúhistánís too, who designated it by what is called in Persian Kúhistán, or the *highlands*."† He then proceeds to give, or rather to *make out* a signification for the word, and applies it to the whole tract forming the culminating ridges of Hindú Kush, as far west as Báلكh, in as plausible a manner as the "*Heydiddlediddlethecatinthefiddle*" inscription is edited and translated in one of the early numbers of Fraser's Magazine for the present year. He will find, however, that there is a tribe of *Sí-áh-pos'h* Káfirs called by the name of *Wámah*, and one of their villages is so named. An account of them and their district will be found in my paper.

Dr. Trumpp states, at pages 5—7 of his article, that the Káfir language, like the Pus'hto, has a short indistinct (?) vowel sound approaching the English *u* in *but*, or the German *ü*; and that "it is not given in my Pus'hto Grammar (1st Ed.) though well known and even marked out by the natives themselves." He then goes on to say, a few paragraphs further on, that he "first mistook this sound for a short *i*, but soon found that it was a peculiar swift *a*, or in fact an indistinct vowel between short *a* and short *i*." He then states, that "the sound of Káfir *a* can only be compared to the peculiar indistinct sound in Pus'hto; as *اَوْدَه سَرِّي* (*mas.*) and *اَوْدَه شَخْه* (*fem.*), which can only be learnt by hearing." To what sound in these four

* "On the Language of the so-called Káfirs of the Indian Caucasus.—By the Rev. Ernest Trumpp, D. Phil., Missionary of the Church Missionary Society." *Journal of Royal Asiatic Society*, Vol. XIX. for 1861.

† The word "Kohistán" is applied to all mountain tracts by the people of these parts—there is the Kohistán of Kábul, the Kohistán to the north of the Suwát river, &c., and not to "Kooner" only, as the Doctor calls it (*Kunir* he means).

words does he refer? to the first word, or the second; to the beginning, middle, or termination of these words? The explanation he gives will, I am sure, be perfectly unintelligible to all who do not happen to understand Pus'hto thoroughly; I think I can clear up the point. The Missionary refers, no doubt, to the adjective **اَوْدَه** which takes a different sound before the final consonant for masculine and feminine nouns; and this peculiar vowel sound only occurs, either in the case of nouns, adjectives, and verbs, before the final consonant of a word. It will be found fully explained in my Grammar, in the declensions of nouns, in the word **غَل** "*ghal*" a thief; in the word **سَخْوَنَد**, "*skhwandar*" a steer, in the fifth variety of nouns of the 6th Declension; in the terminations of adjectives of the same class; and in the terminations of some verbs. I have always written it, in the second edition of my Grammar, as explained by the Afghán author of the "*ÆJAIB-UL-LUGHAT*"* gives it; viz., as a compound sound of short *a* and *i*. Thus in the example which Dr. Trumpp gives (which, in fact, is no example at all, since he places the short vowel point (◌) — "*a*" — over both the adjectives he uses), the first should be written **اَوْدَه** (*ú-dæh*) (mas.) and the second **اَوْدَه** *ú-dah* (fem.). In the work just quoted, the author states,—"The word **اَوْدَه**, is an example of this peculiar sound. When written with simple *r*, *á*, quiescent *gh*, *l* with the short vowel *a*, and unaspirated *h*, or "*há-i-khafí*," it is the third person feminine singular—"she goes;" and when written with simple *r*, *á*, quiescent *gh*, *l*, with a short vowel approaching, to *a* and *i* slightly sounded, and unaspirated *h*, it is the third person masculine plural." These are the exact words of the author as I have given them in my Grammar. The vowel (◌) (*fat'hah*) with (◌) (*hamzáh*) combined — ◌◌ = (◌) give an equivalent sound, as near as possible, which I have therefore adopted. It will be found written thus in the same manner in my Pus'hto Dictionary, in scores of words. The Afgháns, of course, mark it in speaking; but in writing they do not mark it: it is supposed, that a person acquainted with the rules of the language will read and understand it accordingly.

I may mention, that the Doctor has made some considerable errors with regard to the Pus'hto examples he has given. In the words **اَوْدَه سَرْدِي** and **اَوْدَه شَخْه** for example. By the word **سَرْدِي** he evidently means a man; but if so, the letter **ر** is not correct: it should

* See my Grammar, Introduction, pages 34 and 84.

be Afghán $\text{سَرِي} = \text{سَرِي}$ The word for woman should be with Afghán نِس not with Persian ش and with *fat'ha'h* (-) not with *kasrah* (.)— نِسْ , not نِسْ . The pronunciation according to the Doctor's account would be *shidzah*, whilst the Afghán pronunciation is, *k'hadza'h* by the Eastern, and *s'hadza'h* by the Western tribes, the peculiar Afghán letter نِس being widely different from Persian ش .

He considers the Káfir language to be “a *pure Prákrit dialect* ;” yet, a few pages further on, he says :—“Note.—I have not been able to come to any conclusion in regard to the *gender of nouns*. I doubt greatly if any gender be distinguished, as I have not been able to find out any trace of it. So much is clear, that adjectives are not subject to any change, either in regard to *gender* or *case*.” If such be the fact, how can the Káfir language possibly be a “*pure Prákrit dialect* ?”

With reference to the Pashai and Báraikai words which follow, I may mention, that the Pashai language is spoken by the people of that name, who inhabit some of the small districts of the hilly country bordering Káfiristán on the south-west, and on the left, or northern bank of the Kábul river, between Jellálábád and Kábul. The Pashais are counted among the aboriginal people of the country, which the Afgháns are not.

The Báraikais, who are not Afgháns, are included among the people termed Tájíks (supposed to be of Arab descent,) dwell at, and round about Kánígoram, as we generally find it written in English, but properly, Kání-grám, and about Bárák in the province of Loghar, and But-Khák on the route between Jellálábád and Kábul, south of the river of that name.

I shall say nothing here about comparison of the words which follow, although I recognize a great many. It would be unfair towards that class of philosophers called “Comparative Philologists,” who, if they set to work, may discover something wonderful among them, which none but themselves can understand.

It is necessary to say a few words respecting the orthography. The system is the same as used in my Pus'hto works ; viz. that known as Sir William Jones's. The only difference is for the peculiar sounds similar to the Afghán letters, viz ; dd for د , rr for ر and *s'h* and *k'h* for نِس

English.	Sí-áh-pos'h.	Kohisání.	Pashai.	Barakai.	Belúchki.	Kásh-kávi.
A man	man-chí	ádam	pau-jai	sadaiki	mard	rug
A woman	is'tri	ác-rat, is'tri	zá-íf		zál	kumrí
Father	tal-lah	bá-wah	tá-tai	dadai	áyá	
Mother	no-rrú	á-e	á'i, puhtem	maw	a-yá'i	
Brother	burá		lá-yá	marzá	barís	
Sister	sús	sahal	sá-yá		khwár	
Boy	á-jistah	bál-ka'tú	bálakú	kalának	chulhwaro	[kah
Girl	jik	já-gil-kate	wa-yá, lawní	zarigay	chuhwarí or jau-	duk
Grandfather	wá-wa	bud'dan-bá-wah		bábu	ná-ná	kumeru
Grandmother	wá-wai	bud'dan-á-e			ná-ní	
Mother-in-law	chach-hí				zálns	
Father-in-law	sú-sur	shahír			wasarg	
Son-in-law	za-má	jámai				
Male	wú	dér } gorú	ghoddá	yásp	zá-yau	as-tor
Female	is'tri } usp	is'tri } gorú	{ ardá (m.)	{ nar-go'e (cov.)	klá-yar	leshú
Bullock	gáo	kulánk	{ gá (f.)			
Cow	is'tri-gáo					
Camel	ush-túr	us'atur			lerro	
Ass	nít	kúr	{ khartá (m.)	úgh	lá-ka	
Goat	u-sah	pújz	{ khartí (f.)	kharr	buz	
Sheep	mushal	barú	{ so-ata (m.)	bak-rí		
Lamb	barú	duknú	{ phá-jaddik (f.)	{ baratá (m.)	ridd	
A pig or hog	ianu-rú	súr	únddarik		gor-ándd	
A cat	sh'pash	pas'hak			sú-ar	
A kid	palámi				billí	
					pahohar, pahash	

Fish	masih	nun'h	mákh	má-hí	macshí
A sparrow	man-gashé	piclin		konk	churi
A partridge	juú	szu-wai			
Crane	slin	kaika			
A crow	koruk	karú	tádtá	á-lú	kuághé
A deer	shidú (m.)	mar'wah (f.)	ledshí		ít-suk
A roe	walucy	húl	lawich		tuholagh
A jackal	húl	lambá-hí			
An otter	ál-wakí	músh			
A fox	mislak	warandú juro			ionslak
A rat	busin	boz			báz
A hawk	ash-lak	much			
A falcon	rich	sir	máo	khirs	rawsh
A bear	shú	dámún	wágh	toawí	máh
The sun	mas	ttúnak	abali	mar-wokh	hor
The moon	wesba	ju	dewás	harán	jührat
Rain	ná-rú, mai-ár	wila	wyál	rosh	rosh
A cloud	karah-yáo	sahar		gha	shaf
Day	rad-ár	trim-shihí	bákutá, gan'dí		
Night	dl-kin	jish'tarú	chontá, kam	sturra	lut
Morning	trim-shí	sital-lú	fin	zari	tsyuk
Evening	jish-rú	sin	asnl		
Great	achah-tú	á-slin	wádd	gap	
Little, small	züm	dúkú	silá		
Snow	wát	shu-lú			namá-shám
Hail	unúwey	pú			
Stone	ám-roy	siluel			
Clod of earth	palál	dúr	dár	gon	daz
Mud	wát-palál	ingwar	an-gár	aron	dár
Earth, dust	dlaw	wuruk	wark	wokh	ás
Sand	alah-angáo				áf
Wood	a-wi				ág
Fire					au ₅ r
Water					

English.	Sí-áh-pos'h.	Kohistání.	Pashai.	Báarakai.	Belúchki.	Kásh-kárí.
Bread	phayásh	áh-ú	áú	warosht		
Milk	zú	chír	chír	píka/h/b		chír
Butter	nú-hey	núní	núnú	maská		
Clarified butter	anaw	kost		run		
Rice (husked)	kasht	í-shúl		w' rizza	chawal	
Wheat	gúm	gúm	gom	ganum		
Barley	arv-pas	júzú		spag		
Pulse	mosh	miush				
Bean or pea	síw	síw				
Coagulated milk	cher	júghrút	chír	gháp		
Butter-milk	niwah	kar-wú				
Kind of cheese	K'rút	K'rút				
Carpenter	zane-júwo	zilím			gilim	
Felt (cloth)	pilas	namad			wángá	
Fowl	ki-khar	kukur		kirji		
Duck		murg-h-áwí				
Kite		musht-dá				
Hare		chúsak			hil	
Quail		shuyúl			khar-gosh	
Lip		úsh-tú				
Breast		sinú		lab		
Shoulder		chika		sina		
Hand		as-tún	dur			
Foot	chápálpain	poe	sina			hast
A year	kur	kúl	pá			pong
Hail		ashín				
Charcoal		askawúr				
A dog	tún	shúnak			sál	
Frog		moku				
God	dogham					
Thunder	trankías					

A needle
Hair thread (ofrope?)
Rope, cord, twineA (tent) peg
WoolGoat's hair
Come (v.)

Go (v.)

Come

Went

Seize

Give

Bring

Look

Eat

Don't eat

Strike

Don't strike

Don't come

Sit down

Don't sit

Rise up

Do not rise

Eat up

He eats

He will eat

He will not eat

Why does he not eat?

Killed

Is killed

He kills

Kill you

Why did he kill?

chilau chí

jzwey minah

minah

kúl

upáme-jzey

usah-jzey

áne-usan

usan

iw-zah

gahcy

adum

píl

wirah

iw

na-yamú

wela

na-usan

nihil

na-nishíl

a-i

na-a-f

yá-shey

ae-yáshey

kájja-yáshey

nah yáshey

ká nah yáshey

jiná

jiná-ka

dedenú

ch'm-run

kanjo jiná

shíya-shí-án

meh

wadai

radzai

tso

nassa, ú-ra

shera

ráw-ryá

dzana

meh

hast

dzana

meh

hast

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jzitarálcy

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barah-jzútt

ch'arú-jzútt

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áth-itl

guwai

kurah

wá

dí-á

jzu

má-jzú

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má-an

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má-an

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English.	<i>Sí-áh-pos'h.</i>	<i>Kásh-kári.</i>	Kohistání.
Sword	tar-wálí	kongur	
Iron			<i>chamún</i>
Axe	<i>cha-wí</i>		<i>wáttí</i>
Shield	karai	huri	
Soldier	as-tah		
Chief	<i>sal-manash</i>		
Troop	kat-kai		
Wall	bar-kán		
Matchlock			to-bákh

*Some Persian Inscriptions found in Srinagar, Kashmir.—By the late
Rev. I. LOEWENTHAL.*

I. THE MOSQUE OF SHAHI HAMADÁN.

As the traveller glides up the placid Jelum from Baramula, and passes under the cedarn bridges of Srinagar, wondering at the tall, gable-roofed, many-storied houses on the banks, with their unoriental profusion of windows, his attention is arrested by a curious building on the right bank between the Fateh Kadal and the Zaina Kadal (bridges), which, if he enters Kashmir from the west, he will not readily guess to be a mosque, having probably passed by unnoticed similar buildings at Shádarra and Baramula. The pyramidal roof, broken into three equal portions, ending in a most curious steeple resembling a belfry, with gilt bell and heart-shaped ornaments at the top, the four corners of the roof adorned by wood tassels, the projection of the roof beyond the walls of the building;—all this reminds one more of a Chinese pagoda than of a Mohamedan place of prayer. The impression one receives from the structure leads to the idea that the period of the erection of the building may have been one in which an older form of building, that of the Hindu temple peculiar to the valley, was still influencing the architects to whom Mohamedanism was as yet comparatively new.

The building may be said to be constructed entirely of wood. Massive beams of the indestructible Himalayan cedar placed upon one another, the interstices being filled up by small bricks, form a solid square whose sides are relieved by well-proportioned balconies in the upper story, the floors and roofs of which are supported by light and graceful carved wooden pillars.

Curious as is the appearance of the building, its history seems as curious. At every turn in Kashmir one meets with evidences of the policy of the Mohamedans to turn idol-temples into mosques, tombs, and shrines. This place is an instance. There was on that spot a famous spring sacred to Káli with (probably) buildings over and around it. Sikandar called Butshikan (idol-breaker), the grandson of the first Mohamedan king of Kashmir, built the present structure with the rich property belonging to the Hindu temple, as a خانقاه for the numerous Sayids who are said to have come into the country with Sháhi Hamadán, and who were adopting a monastic form of life. After the death of Sháhi Hamadán, a shrine in his memory was erected over the very spot where formerly the sacred spring welled up. It is not uninteresting to compare with this the practice of other countries, such as the tradition which existed in Rome concerning the sacred well under the Capitol, and that under the temple of Apollo at Delphi; or the fact that in the time of Hadrian a temple of Jupiter-Serapis was erected on the place of the crucifixion, and one sacred to Venus-Astarte over the real Holy Sepulchre.

For five centuries now have the Mohamedans of Kashmir been in possession of this spot consecrated to the memory of the Hamadán Sayid. Shall any one dispute their right to hold it now? Yes. The Hindus of Kashmir—they are almost all Brahmans—whatever else they have forgotten of the history of their country, have not forgotten this spring of Káli. The Dharm Ráj—the rule of a Hindu king—has been restored to them; the present ruler moreover is a *devout* Hindu; and they are claiming their sacred spring. Twice already have the Mohamedans had to redeem their shrine, but this has not saved them from a great indignity. On the wall fronting the river, which wall really belongs to the mosque, the Brahmans have put a large red ochre mark as the symbol of Káli, and Hindus may be seen rubbing their foreheads and employing the forms of idolatry but a step or two

from the spot where the Mohamedan is now only allowed to whisper :
 " God is great !"

The news that a Mohamedan had usurped the throne of Kashmir reaching the countries to the West caused a large influx of Sayids and other holy characters into Kashmir. Mír Sayid Alí Hamadání, subsequently known as Sháhi Hamadán, came to Kashmir a *number of times*. This consideration reconciles the discrepant statements of the native historians that he came from Bokhara, that he came direct from Hamadán in Persia, and that he came from Baghdad. Bírbar Pandit Káchrú states that he came to Kashmir in 782 H. (A. D. 1380) for the third time. This date appears to be more correct than that given by Captain Newall in the Journal for 1854, p. 414. He mentions, on native authority, the year 790 H. (1388) as the date of his *first* arrival apparently. This cannot be true, if the inscription over the door of the mosque Sháhi Hamadán is correct, which gives as the date of his *death* the year 786 H. (1384). There is, however, great confusion in all the dates of Kashmirian history. Thus, Captain Newall, on the authority of Kashmiri historians, places the first usurpation by a Mohamedan of legal power in Kashmir in 1341, whilst Baron Hügel, following Abul Fazl, mentions 1311 as the year of Shamsuddín's accession to the throne. Haidar Malik Chadwaria gives the titles of two books, the *شمه منطق* and the *شرح سراجي*, which the Sayid wrote at the request of Sikandar Butshikan. He died, during one of his journeys, in Pakli, a beautiful valley now belonging to the British district of Hazára. There is a mysterious-looking structure about halfway between Abbottabad and Mánasihra, which we may, in default of any information concerning it, fix upon as the tomb of Sháhi Hamadán.

The readiness with which a people forcibly severed from idolatry passes over to hagiolatry, may be seen from three inscriptions at the entrance of the mosque of Sháhi Hamadán, copies of which are sub-joined.

1. Large letters on a ground of gold.

هر فیض که در سبته هردو جهان است
 در پیروئی حضرت شاه همدان است
 شاه همدان بلکه شهنشاه جهان است
 ای خاک بوان دیده که در ریب و گمان است

Translation.

Every advantage existing before either world
Is obtained by the followers of Hazrat Sháh of Hamadán ;
Sháh (king) of Hamadán, or rather Sháhansháh (emperor) of the world.
A curse on the eye which looks on with doubt and suspicion !

2. In Arabic characters on a ground of gold.

تاریخ و فات وی
چو شد از گاه احمد خاتم دین ز هجرت هفتصد و سنه و ثمانین
برفت از عالم فانی بباقی امیر هر دو عالم آل یاسین

*Translation.**Date of his death.*

In the year 786 from the time of Ahmad, the seal of religion (that is) from the Hijra, there went from the transitory to the eternal world the prince of both worlds, the descendant of Yásín.

Note. "The descendant of Yásín," آل یاسین, a curious expression to denote the descendants of the prophet. *Yá Sín* یاسین is the name of the thirty-sixth Sura of the Koran, which is so called from the fact that these two letters mysteriously stand at its head. Their meaning is uncertain. The Sura itself is considered particularly sacred by the Mohamedans, and is read by them over dying persons: they say that Mohamed called it "the heart of the Koran."

3. Inscription in crimson characters.

ایدل اگر ت مطلب فیض دو جهانست رو بردر شاهنشہ شاه ہمدانست
مقرون اجابت زدر اوست دعا را عرش است درش بلکه از عرش نشانست

Translation.

Oh heart, if thou desirest the benefit of both worlds,
Go, it is at the gate of the emperor Sháh of Hamadán.
At his gate prayer obtains an answer ;
His gate is the heavenly pavilion ; nay, the pavilion is a type of it.

II. THE TOMB OF ZAINUL'ÁBIDÍN.

Some little distance from the Sháhi Hamadán mosque down the bank of the river there are some remarkable massive remains of the outer wall of a Hindu temple—mentioned by Col. Cunningham in his Essay on the Aryan Style of Architecture—with its trefoil arches and sculptured Hindu divinities. The temple itself disappeared before the fanatical zeal of the early Mohamedan kings, and the inner space was

converted into a graveyard for royalty. There is only one *large* tomb (or rather the ruins of one) in this inclosure, and this is said to be the tomb of Zainul'ábidín, called Jaina-laba-dína in the Sanskrit history of Kashmir which forms the sequel to the Raja Tarangini. The tomb somewhat resembles in its general outlines, though on a much smaller scale, that of Anárkalí at Lahor. It is now used as a Government granary. It is surrounded by a large number of smaller tombs. Over a postern gate there is the following inscription :

در زیارت روضهٔ اجداد خود سلطان حبیب
دیدوگفت این جای شاهن تنگ گردد عنقریب
صفه و دروازهٔ دیگر بپهلویش فزود
تا ازین روضه نگرده هیچ شاهى بی نصیب
گاه تعمیر بنای نو شنیدم از سرورش
سال تاریخش مزار ثانی سلطان حبیب

Translation.

On visiting the sepulchre of his forefathers, Sultán Habíb
Saw it and said : This royal place will soon become too narrow.
He erected another daís and door by its side,
So that no king might fail of the blessing of this Sepulchre.
At the time of erecting the new building I heard by inspiration
The year of its date : "The second sepulchre of Sultán Habíb"—981.

Note. This date also evinces the uncertainty of the dates in Kashmirian history ; for according to Captain Newall (A Sketch of the Mohammedan History of Cashmere, J. A. S. 1854, p. 426.) Habíb was killed long before this date, in A. D. 1557. The native historians, at all events, put his deposition nearly twenty years before the date of the inscription. Narayan Kol states that Habíb Khán became king of Kashmir in H. 960. In 961 he committed great mistakes in the administration of justice, so that the pillars of the state became ashamed of him. Hence Alí Khan put the crown on the head of Ghází Khan, his brother (both being uncles of Habíb by his mother's side) ; this was the beginning of the Chak dynasty. Hügel gives Chak as an abbreviation of Chaghatai. 'Ázam, another historian of Kashmir, puts the beginning of the Chak dynasty in the year H. 962 ; he calls Habíb the son of Ismaíl Sháh, whilst Narayan Kol gives Shamsuddín (Ismaíl's brother) as the name of his father.

In a corner of this same graveyard there is a large slab with an inscription which is remarkable as being connected with the first recorded visit of an Indian Officer to the valley of Kashmir.

Inscription.

میرزا حیدر کورگان ابن میرزا محمدحسین کورگان ونواسه یونس خان
 خانه زاده بابرپادشاه ویزنه ابوسعید خان بادشاه یارکند و مغلوستان ابن
 یونس خان مذکور از اولاد توغلوک تیمور خان از نسل چغتائی این چنگیزخان
 مولد میرزا وقت محمود سال نهم صد و پنجاه ۹۰۵ در شهر اوراتبه و بعد نصاریف
 زمان بحکم ابوسعید خان از یارکند برآمده پس از تسخیرتبت در همان سال
 با چهار هزار سوار بتاریخ روز چهارم از ماه شعبان سنه ۹۳۵ فتح کشمیر کرده باز
 بمحمد شاه که بادشاه کشمیر بود داده نزد ابوسعید خان که تبت مانده بود
 رفت خان او را مامور لاسه نمود خود بیارکند کوچ کرده در راه مرد تفرقه
 کلی بمیرزا روداده به بدخشان رفت باز بهند نزد همایون بادشاه رسید درحین
 که پادشاه منهنم بایران میرفت میرزا با چهار صد و پنجاه سوار از لاهور برآمده
 در بست و دوم رجب سنه ۹۷۴ دوباره کشمیر را گرفته ناده سال حکمران بود
 از قضای الهی سنه ۹۸۷ بغلط از دست احاد الناس شهادت یافت میرزا بلاد
 توران و مغلوستان و هند دیده و بتخدمت بزرگان رسیده باهر اکثر هنر و سخنور
 و جوان دلیر و صاحب تدبیر بود تاریخ رشیدی تالیف اوست بموجب فرمایش
 ولیم مورکزرفت صاحب بهادر میرآخور باشی دولت انگلیشیه باهتمام سید
 عزت الله خان صورت احوالها سنه ۱۲۳۸ از روی طوامیر بتحریر تاریخ سنه
 ۱۲۳۸ یازدهم جمادی الثانی سنه ۱۲۳۸ یونتئیل دیباجه اثبات شده

Translation.

Mirzá Haidar Gúrgán, the son of Mirzá Mohamed Husain Gúrgán and grandson of Yúna Khan (who was born in the house of Baber the king), and brother-in-law to Abú Sa'íd Khan, king of Yárkand and Moghulistán, the son of Sultán Ahmad Khan, the son of the above-mentioned Yúnas Khan, of the progeny of Toghlúq Taimúr Khan, of the race of Chaghatai, the son of Changíz Khan. The Mirza was born in the time of Mahmúd, in the year 905, in the city of Orátapa. After various vicissitudes he, at the command of Abú Sa'íd Khan, made an incursion from Yárkand. After subduing Tibet he conquered Kashmir with 4000 horse, in the same year, on the 4th Sha'bán 935. He then gave it back to Mohamed Shah, who was the king of Kashmir, and went to Abú Sa'íd Khan, who had remained in Tibet. The Khan ordered him to Lása. He himself having set out for Yárkand, died on the road. As there appeared to be general dis-

cord, the Mirza went to Badakhshán, and then to Hindustan. He came to the Emperor Humáyún as the latter having been defeated was proceeding to Iran. The Mirza went on another expedition with 450 horse from Lahor, took Kashmir again on the 22nd Rajab 974 and ruled Kashmir for ten years. He was accidentally killed by some man in the year 987. The Mirza had seen the cities of Túrán, Moghulistan, and India, and been engaged in the service of the great. He was skilled in most sciences, eloquent, brave, and wise in counsel. The *Tárikhi Rashídí* was composed by him. By the order of Mr. William Moorcroft, Vety. Surgeon under the British Government, Sayid Izzat Ullah Khan compiled from records an account of the events to the year 1238. The preface was written on the 11th Jamádussáni 1238 Yúnt I'.

Note 1. The expression "Yúnt I'" denotes the seventh year of the cycle of twelve, current in the chronology of the Arabians, the Persians, and the Turks (or Moghuls), though each nation has its own denominations for the different years. The *Ayíni Akbarí* gives a full account of these cycles, which were employed for the adjustment of intercalary periods necessitated by the disagreement between lunar and solar years. The Turki cycle was also called *I'ghúrí* (Oighur is the Russian spelling of the word). The names of the different years are the names of certain animals. They are as follows :

- | | |
|---------------------|----------------------|
| 1. Síjqán—a mouse. | 2. U'd—a cow. |
| 3. Páras—a panther. | 4. Tawishqán—a hare. |
| 5. Lúí—a crocodile. | 6. Yílán—a snake. |
| 7. Yúnt—a horse. | 8. Qú—a sheep. |
| 9. Bích—a monkey. | 10. Takháqú—a fowl. |
| 11. I't—a dog. | 12. Tankúz—a hog. |

To each of these names the word *I'* was added, which denotes "year." In Kashmir and Afghanistan, though this calendar is now obsolete, the memorial verses containing these twelve names, are still remembered. The present year is Tankúz. The verses are as follows :

سیچقان و اود پارس توشقان و لوی ٹیل است
ایلان و یونت و قوی بود نام های سال
پیچ ٹیل پس تختاقوی ایت ٹیل بعد ازان
تذکوز را حساب کن ای صاحب کمال

Note 2. The dates of this inscription also do not agree with those given by the native historians. The inscription places Haidar's first invasion in the year 935. Bírbar gives as the date 939, though he agrees with the inscription in the number of horse, 4000; Captain Newall gives the less probable amount of 14,000 cavalry. Hügel (following principally Abul Fazl) gives 930 (A. D. 1523) as the year of the invasion, and 10,000 as the size of the army. It is possible to reconcile these statements by assuming that the army of invasion consisted of 10,000 foot and 4,000 horse. The second invasion the inscription places in 974; Captain Newall (who does not seem to recognise the invader as the Mirza Haidar of the former invasion from the north) gives its date as 947, which is in general agreement with the above-mentioned Pandit, and with Hügel, both of whom give 948 (1541); the latter, however, speaks of "a considerable force." The statement of the inscription must probably be understood to mean that he set out from Lahor with 150 horse; he probably gathered an army of adventurers and malcontents as he proceeded. The confusion is very great in that part of the histories of Kashmir, which relates to the decade of Haidar's *rule*,—it does not seem to have been *reign*—principally because he who was at one time Haidar's nominal sovereign, was soon afterwards his nominal opponent. The name of this individual, evidently a puppet, so common in all Asiatic histories, was doubtless *مارك* but whether this should be read *Tárik* Sháh, as Bírbar reads, or *Názik* Sháh, as Hügel reads, appears uncertain; Captain Newall gives the name *Tarkh* Shah, which is undoubtedly wrong. In this period also falls the first recorded attempt on the part of the Moghul emperors to take possession of the valley. For Haidar, much harassed by the rising Chak family, offered the sovereignty of the country to Humáyún, when it was really no longer in his power to offer it. The Mirza's embassy found Humáyún encamped at Atok, on his return from Persia to Hindustan. Humáyún set out immediately for Kashmir; but the expedition failed, as the army mutinied at or near Mozufferabad. Haidar's death the inscription places in 987, Bírbar in 959. The latter relates that during his war with *Tárik* Shah, Haidar went alone into the fort of Avantipúr; a butcher asked him who he was; he could not reply in Kashmiri, whereupon the butcher killed him with the axe which he happened to have in his hand. Newall says that his death took place (in 1551

A. D.) as he had issued from the fort of Indrakoul to reconnoitre the enemy's position.

Note 3. A question remains whether Moorcroft had this inscription cut, as appears most probable, and if so, why. The reply has been suggested that he did it in order to put on record the feasibility of an invasion of Kashmir by *cavalry* from the north as well as from the south. It is not unworthy of remark that many a tourist, misled by the name of William Moorcroft upon the tombstone, has stated, in print and out of it, that Srinagar contains the grave of the enterprising traveller.

III. Inscriptions on and near the Great Mosque.

Opposite the principal entrance of the Jami Masjid, a building most remarkable for its numerous tall cedar pillars, there is a *bauli* with the following inscription :

بر آمد چشمه فیض الهی	بحسن سعی مشتقی خاکساران
بتوفیق خدا این کار محمود	گرفت انجام و مشکل گشت آسان
خلوص نیت و صدق ارادت	شده صرف بنایش از دل و جان
پی دنیا و دین این آب رو بس	که شوید روی خود زو هر مسلمان
ازین چشمه بانپی چشم دارد	که یابد شست و شو طومار عصیان
گناه خلق گردد شسته زین آب	که باشد مبنعش دریای عرفان
بود وجه کرایه از دکانین	بی ترمیم حوض فیض جریان
خدا یا بانیش را از تفضل	بدست خود بده تشریف ایمان
که دارد ورد خود این بیت اوستاد	ز روی التجا با چشم گریان
چونامم درازل محمود کردی	الهی عاقبت محمود گردان
بدریای تفکر رفته آگه	پی تاریخ این فرخنده بنیان
خضر گفتا که جاری فیض ماباد	همین تاریخ بنویس ای سخن دان

الهم اغفر لبانیه ولوالده یا غفار سنه ۱۰۵۲

Translation.

The fountain of God's favour came forth through the laudable efforts of a handful of humble men.

By the grace of God Mahmúd began this work, and the difficult became easy.

The fund for its construction was purity of intention and sincerity of aim, with earnest hearts.

Of worldly and religious glory this is enough that every Musulman may wash his face in it.

From this fountain he (the builder) looks for that in which the record of transgression finds cleansing.

People's sin is washed away by this water whose source is the sea of knowledge.

Let the amount of the rent of the shops be for the repairs of the tank flowing with blessing.

Oh God, with thine own hand give graciously to its builder the ennobling faith.

For this, the teacher's verse, has its own task ; he takes refuge with weeping eye (and says) :

As thou at the beginning hast given me the name of Mahmúd, oh God, make it Mahmúd in the goal !

Into the sea of thought the Intelligent Man (*i. e.* the composer of the inscription) went for the date of this auspicious building.

Khizt said, Let my favour flow on ; write this date, oh poet :

Oh God, pardon its builder and his father,—Oh Pardoner!—1056.

At the entrance of the Great Mosque itself, there is the following decree of the Emperor Sháh Jehán :

شاه جهان بادشاه غازی

نقل فرمان سعادت نشان حضرت سلیمان مکانی صاحب قران ثانی
 که بتاریخ هفتم اسفندار صد مائه الهی حسب الالتماس کمترین خانزادان
 احسن الله الخطاب بظفر خان در باب برطرف نمودن بدعت هائیکه در زمان
 صوبه داران سابق درلده دلپذیر کشمیر شده بود و باعث خرابی رعایا و سکنه
 این دیار بود شرف ورود یافته *

فرمان

چون همگی همت والانهمت مصروف ومعطوف بر رفاهیت خلق است بنابراین
 بعضی امور که در خطه دلپذیر کشمیر باعث آزار سکنه اندیاری می شد حکم
 فرمودیم که برطرف باشند از جمله آنمقدمات یکی آنست که وقت چیدن
 زعفران مردم را به عذف میدردند که زعفران بچینند وقلیای نمک بعلت اجوره
 آن بانمردم میدادند وازین جهت بانجماعه آزار بسیار میزدند حکم فرمودیم
 که تکلیف چیدن زعفران اصلا بکسی نکنند وانچه تعلق بخالصه شریفه داشته
 باشد مزدوران را راضی ساخته اجوره واقعی بدهند وانچه تعلق بجاکیردار

داشته باشد کل زعفران بچنس حواله جاگیر دار نمایند تا هر طریقی که خواهند بچینند مقدمه دیگر آنست که در زمان بعضی از صاحب صوبه های کشمیر بر سر خوارشالی دو دام بعلت هیزم میگردند اند در عمل اعتقاد خان چهار دام بان علت بر سر خوراری گرفته میشد چون ازینجهت ازار بسیار نیز برعایا می رسید بنابرین حکم فرمودیم که بالکل رعایا را از طلب این وجه معاف دارند و بعلت هیزم هیچ چیز نگیرند مقدمه دیگر آنست که دهی که جمع آن زیاده از چهار صد خوارشالی بوده باشد از آن دیبه دو گوسفند حکام انجا هر ساله میگردند اند و اعتقاد خان در ایام صاحب صوبگی خود بجای گوسفند بر سر هر گوسفند شصت و شش دام میگردند چون ازین جهت نیز برعایا آزار تمام می رسید بالکلیه حکم فرمودیم که بر طرف باشد نه گوسفند بگیرند و نه نقد باین علت رعایا را از گرفتن آن معاف دارند دیگر اعتقاد خان در ایام صاحب صوبگی خود سرا سری نموده بر سر هر ملاحی خواه جوان و خواه پیر خواه خورد سال هفتاد و پنج دام میگردند و معمول قدیم آن بوده که بر سر جوانی شصت دام بر سر پیری دوازده دام بر سر خورد سالی سی و شش دام میگردند اند حکم فرمودیم که دستور سابق را معمول داشته بدعتیکه اعتقاد خان کرده بر طرف داند بمقتضای آن عمل نکنند مقدمه دیگر آنست که صاحب صوبه ها در وقت میوه در هر باغ و در هر باغچه که میوه خوبی که گمان داشته اند کسان خود را تعیین می نموده اند که آن میوه را بجهت آنها محافظ نمایند و نمیگذارند که صاحبان آن باغ ها و باغچه ها آن میوه را متصرف شوند ازین جهت آزار بسیاری بانجماعه می رسد چنانچه از آن مردم درخت های میوه را دور ساخته اند حکم فرمودیم که هیچ صاحب صوبه قرق میوه باغ و باغچه کسی نکند می باید که حکام کرام و دیوانیان کفایت فرجام و اعمال حال و استقبال صوبه کشمیر این احکام جهان مطاع را مستمر و ابدی داند تغییر و تبدیل بقواعد آن راه ندهند هر کسکه که تغییر و تبدیل را راه دهد بلعنت خدا و بغضب پادشاهی گرفتار خواهد شد تحریر فی القاریخ ۲۶ آدر ماه الہی •

Translation.

GOD IS GREAT.

Shâhi Jahân the King, Defender of the Faith.

Copy of the auspicious order of his Majesty who occupies the place of Solomon, the Lord of the Conjunction, the Second, which was recorded on the 7th of Isfandârmuz (February), according to Akbar's calendar, on account of the petition of the least of slaves (may God be gracious to him who is known by the name of Zafar Khan), with reference to the removal of the oppressions which were practised in the time of former Sûbadârs in the beautiful city of Kashmir, and

were the cause of the ruin of the subjects and inhabitants of these regions.

Firmán.

Since all our exalted desire is turned and bent on the contentedness of the people, hence we gave the order for the repeal of some acts which in the beautiful country of Kashmir became a cause of distress to the inhabitants of the land. Of the number of those matters one is this that, at the time of collecting the saffron, men used to be impressed for this work without any wages except a little salt, and hence the people are suffering much distress. We ordered that no man should by any means be molested as to gathering the saffron; and as to saffron grown on crown-lands, the labourers must be satisfied and receive proper wages; and whatever grows on lands granted in *jágír*, let the whole saffron in kind be delivered to the *jágírdár* that he may gather it as he pleases. Another grievance is this that in the time of some of the *Súbadárs* of Kashmir they used to levy two *dám* for wood on each *Khárwár* (about 180 pounds) of rice, and during the government of *I'tiqád Khan* four *dám* for the same purpose were levied on each *Khárwár*. Since on this account also the people were much distressed, hence we ruled that the people should be entirely relieved of this tax, and nothing should be taken on account of wood. Another grievance is this, that a village whose rental was more than 400 *Khárwár* of rice, was obliged to furnish to the rulers of the place two sheep annually. *I'tiqád Khan*, during his rule, took 66 *dám* in the place of each sheep. Since on this account also the people were much annoyed, we gave a strict order that it should cease; neither should the sheep be taken nor money in their place; the people shall be held excused from paying this impost. Moreover, *I'tiqád Khan*, during his incumbency, levied a summary poll-tax of 75 *dám* on each boatman, whether a young, or an old man, or a boy, whilst it was the established custom formerly to levy 60 *dám* on a young man, 12 on an old man, and 36 on a boy. We ordered that the former custom should be re-established, that the oppression of *I'tiqád Khan* be stopped, and that people should not act in accordance with it. Another grievance is this that the *Subadárs*, in the fruit season, placed their own men in each garden, large and small, which appeared to contain good fruit, to watch the fruit for themselves and did not allow the owners of those gardens to use the fruit; hence much annoyance

was caused to these people, so that some of these men have destroyed the fruit trees. We ordered that no Subadár should lay an embargo on the fruit of the orchard or garden of any one. It is proper that noble governors and useful collectors and the tax-gatherers of this and future times in the province of Kashmir should consider these orders as lasting and eternal, nor should they admit any change or alteration in these regulations. Whoever admits any change or alteration, will fall under the curse of God, and the anger of the king. Written on the 26th Ádar (March) according to Akbar's calendar.

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*On the Vegetation of the Jhelum District of the Punjab.*—By  
J. E. TIERNEY AITCHISON, *M. D., F. R. C. S., F. L. S.,*  
*Assistant Surgeon Bengal Army, &c., &c., &c.*

To systematise a description of the vegetation, it will be as well to divide the district into several portions, giving a leading and particularised description of what may be considered the principal divisions, and then, comparing the other divisions with those already described, pointing out any characteristic features that may belong exclusively to that under our immediate notice.

For the ready comprehension of the several divisions or tracts, the accompanying diagrammatic map is attached, shewing the district to be divided into

The Jhelum Tract,  
The Jelallpore Tract,  
The Salt Plains,  
Plains upon the Salt Range,  
The Tract of the low ranges of Hills,  
The Tract of Ravines,  
Hills of the Salt Range,  
Tract of Mount Tilla.

#### THE JHELUM TRACT.

The town of Jhelum, consisting of about 500 houses, is the head quarters of the Civil Station, and hence is looked upon as the chief town, although it is in truth but the fourth or fifth as regards number of inhabitants, trade, &c., in comparison with the other towns of this





**JHELUM DISTRICT**

Shewing  
 DIVISIONS AS DESCRIBED  
 In Paper on its  
 VEGETATION,  
 by  
 J. E. T. Aitchison  
 M.D., F.R.C.S.

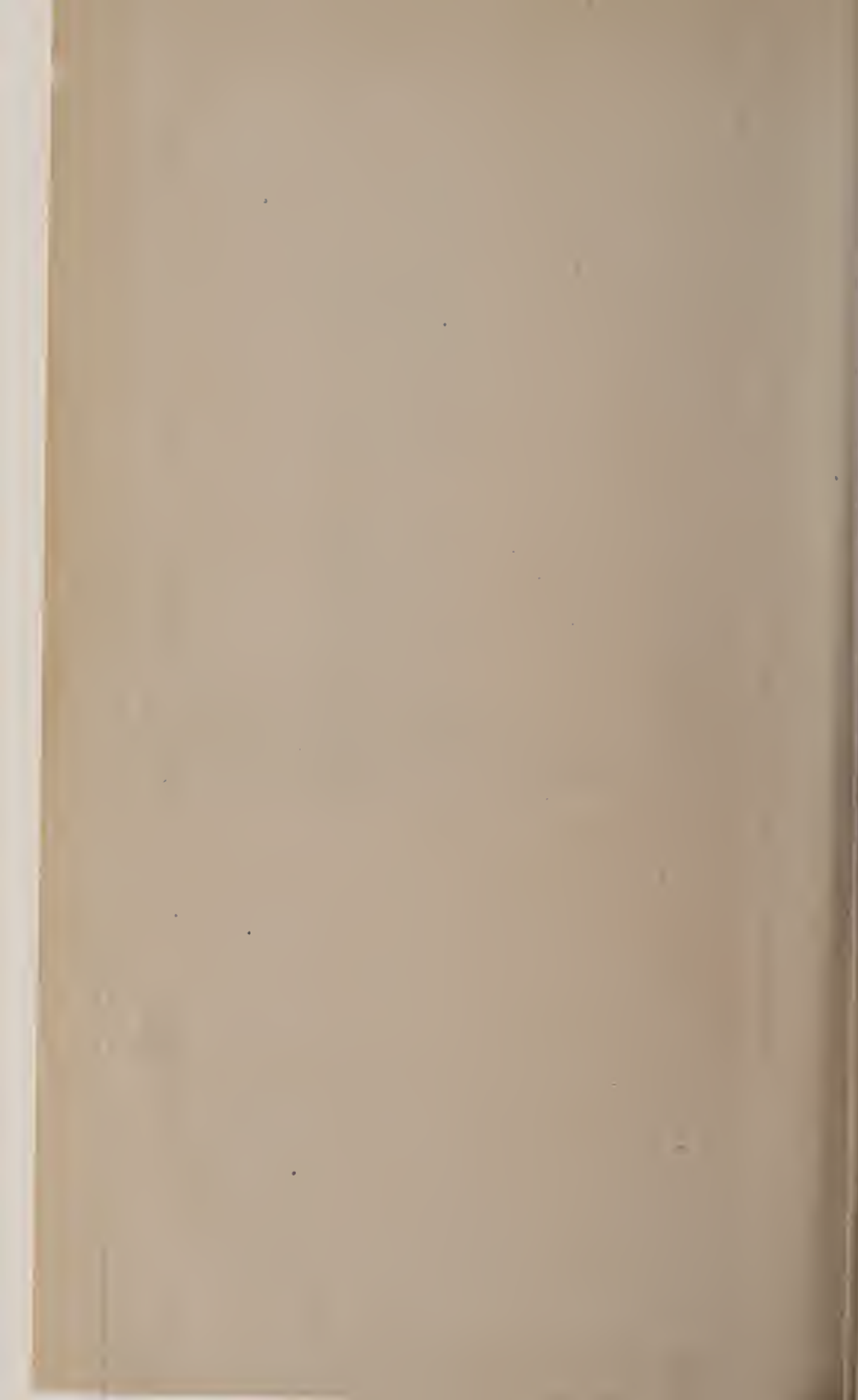


Jhelum town  
 Lat. 32° 36' N  
 Long. 74° 47' E

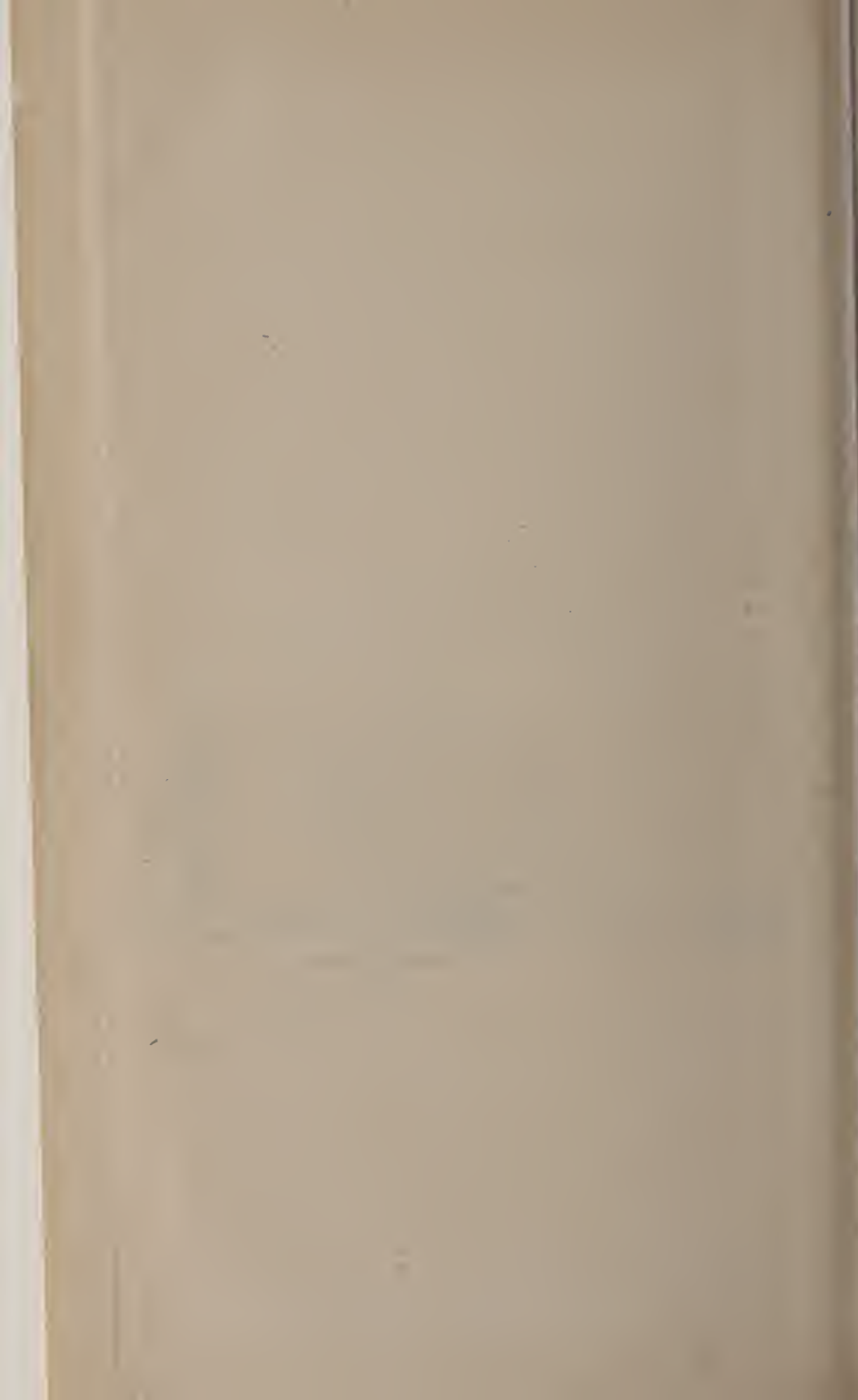














district. It is situated in Lat.  $32^{\circ} 56'$  N. Long.  $73^{\circ} 47'$  E. (A. K. Johnston, 1855) and is about 671 feet above the sea level. It may be considered as occupying the centre of the Jhelum Tract. Nearly a mile to the west of this is situated the Military cantonment, once occupied by a large force of native troops, but since the mutiny, all but left to ruin.

The Jhelum Tract is the plain country enclosed within the Kharian and Ratian ranges of hills, with the Jhelum river running in the midst. It commences at the fort of Mungla, and ends some miles above Jelallpore, where the Kharian range and Surafur hills close in upon the river. It consists on the whole of a beautiful plain, which, near the bases of these hills, is cut up into ravines, but afterwards opens out into richly cultivated flat land. This, on the Jhelum side, is divided into three parts, by the wide sandy beds of the Kuhan (or Bukrala) and Boonah nullas.

The geological formation of this tract consists of—

1st. Recent tertiary, close to the river, which, in some places, as at Doolial and Cyngoe, is made up of a rich mould yielding profuse and good successive crops.

2nd. Pleistocene tertiary; this lies below the recent tertiary, but the latter disappears as we go inland, and the Pleistocene crops out upon the surface, containing beds of kunkur at the river, of some value, with a tolerable amount of surface soil.

3rd. As we approach the base of these ranges of hills, viz., the Ratian, &c., we enter upon a Miocene tertiary country, characterised by deep water-courses or ravines full of huge boulders, shingle and sand. From this the hills suddenly rise up, consisting of clay, marl, conglomerates, and sandstone, the last containing fossils similar to those found in the Sewalik range of hills, of which the geology of these hills is supposed to be the counterpart.

Water is obtained in this tract at little cost and labour, from wells about 20 feet deep, which yield a plentiful supply, fresh and sweet. A well is to be met with, attached to every village, and so many there are several, all worked with the Persian wheel. Their water is not used for irrigation, excepting for tobacco and small patches of cotton, but chiefly for gardens: the former of these crops indeed may be regarded as garden produce. Water is not raised from the river for irrigation. One stream of fresh water, the

Kuhan nulla, runs through this tract. Its water is not used for irrigation, but where this stream passes through the range of hills at Rhotas, its power is used to drive three or four flour mills. The remains of a canal of the old Seikh time are to be traced from near Doolial, in a direct line, to a little above the Civil Lines at Jhelum, across that portion of the country, where the river takes a rapid turn from a southerly to a westerly course.

#### AGRICULTURAL PRODUCE.

Two crops are generally produced during the year, viz., the Rubbee and Khureef. For the Rubbee crop the Zemindars begin to sow about the end of October; and collect the harvest during April. The Khureef crop is sown in June, and is collected about the end of September or during October. The hot weather extends from the middle of April to the middle of October; the cold weather over the rest of the year. The chief falls of rain occur about the end of August or during September. Heavy rains also fall in March and April. The crops generally throughout the Jhelum district are dependant for their maturity upon these special falls of rain.

The chief products of the Rubbee crop are, Wheat "Gehun," *Triticum æstivum*, var.; Barley, "Jhow," *Hordeum hexastichon*. Gram, "Chunna," *Cicer arietinum*; Rape, "Surson," *Brassica campestris* and *Eruça* L.; Linseed, "Usee," *Linum usitatissimum*; Safflower, "Kusoomba," *Carthamus tinctoria*; with a great variety of the Melon tribe.

Those of the Khureef crop are—

Millet, var. "Bajree," *Penicillaria spicata*. Millet, var. "Jowar," *Andropogon Sorghum*; Cotton, "Kupas," *Gossypium herbaceum*. Indian corn, "Makee," *Zea Mays*. Sugarcane, "Gunnah," *Saccharum officinarum*; Oil seed, "Til," *Sesamum Indicum*; Indian hemp, "Sunn," *Crotalaria juncea*.

Where irrigation may be resorted to throughout the year, tobacco and rape are raised during the whole hot season, as in the Goojerat district.

Wheat. Of this the bearded white variety is that which is chiefly grown, although the red is not uncommon; both are of average quality. A large exportation of this takes place; chiefly towards Mooltan.

Barley. The six rowed variety is produced of a very superior quality and is largely cultivated; the greatest part of this crop being also exported towards Mooltan.

Gram. This is cultivated, but in small patches in this tract—of a fine quality. The quantity, however, is not sufficient for local consumption, a large importation taking place from other parts of the district. Along with it we have the “Massoor,” *Eruum lens*, cultivated, either mixed with the former or separately.

A very small quantity of the pulses are cultivated in this tract, viz.

“Moth.” *Phaseolus aconitifolia*.

“Mung.” *Phaseolus mungo* (The split peas of which constitute the varieties of Dahl). Their quality is good, though the crop is scarcely sufficient for local consumption.

Bajree and Jowar, both excellent in their quality, are very largely cultivated, and together with barley and wheat may be considered the staple crops of the whole district. The Zemindar-class live chiefly on the Bajree and Jowar, consuming for their food little of either wheat or barley. Their cattle also are largely dependant for fodder upon the Boossa obtained from the crushed stalks and leaves of the two former, owing to the great want of pasturage in this tract. There are several kinds of Boossa for feeding cattle, viz., that most commonly in use, which is produced, as already stated, from the crushed leaves and stalks of the Bajree and Jowar; that made from the straw of wheat and barley; that made from the straw and leaves of the pulses and gram, which last is the highest in price and by the natives given chiefly to their horses, as also to cattle for fattening. Lastly, Boossa obtained from the leaves of the “Baer” the *Zizyphus vulgaris*.

Oil seeds. Of these we have—

“Surson.” The seeds of *Brassica campestris*, and *Eruca*, L. which by simple expression yield oil called commonly “Surson ka tel,” or “Thara meera ka tel.” *B. Eruca* yields a darker oil than *B. campestris* and hence, to distinguish this oil from that of the latter, it is often called “kala surson ka tel” or “kala surson.” The seed of the Til, *Sesamum Indicum*—also by simple expression, yields “Til ka tel” viz. Til oil.

The seed of the flax “Ulsee” yields “Ulsee ka tel” viz. Linseed oil. The plants of the above are cultivated, but not in sufficiency for the uses of the tract, and hence their products are largely imported.

Cotton is grown in tolerable quantities, but as a field crop, is very poor in quality. Where, however, it is grown as a garden crop and freely watered, some of the produce is exceedingly good, both as

regards quantity and the quality of the fibre. The fact is, that the soil in general is too poor and too dry, but if this be properly enriched with manure, freely watered, and under shade, a good crop is the usual result.

Tobacco. "Tumbakoo," *Nicotiana Tabacum*, is cultivated more as garden produce and undergoes free irrigation. There is not so much raised as is required for local use, but what is raised, is considered of a good quality.

Safflower. Of this a large quantity is cultivated, good in quality, and sufficient both for the local market and for exportation. The seeds are used, though not extensively, for making oil.

Indigo. *Indigofera tinctoria*—"Nil," is cultivated strictly for home consumption, and is used for dyeing the beard of the cultivator.

Rice. "Chaul," *Oryza sativa* has been cultivated in this tract, but very rarely. The fact is, there is no soil sufficiently moist and loamy for its cultivation.

Sugar-cane grows in this tract only as a garden product, not to have its juice extracted for the preparation of sugar, but to be sold in the bazar in the cane, and thus eaten by the natives. The cane is very poor, being small and exceedingly silicious.

"Sunn," *Crotalaria juncea* and "Sooja Para," *Hibiscus cannabinus*—are both grown in small patches and in stripes round fields, the first, however, more commonly. The fibres of both are good, and are manufactured into a coarse twine by the zemindar and thus sent to market. They do not seem to be cultivated for exportation.

#### GARDEN PRODUCE.

From gardens, which are attached to nearly every village, we have the markets well supplied with all the vegetables that are usually cultivated by natives, and which are used extensively by them in the form of "thurkarees." The principal vegetables are "Moolies," varieties of the radish—"Piaz," onions—"Baingons," egg-plant, *Solanum Melongena*; "Sha'gum," varieties of the turnip—"Poluch," varieties of the spinach—"Gaager," varieties of carrot—"Shuker-kund," species of Arum—"Moukha," *Portulaca oleracea*—"Ram-turai," *Hibiscus longifolius*—besides an immense variety of the *Cucurbitaceæ* viz. "Kudoo," *Cucurbita Pepo*; "Keera," *Cucumis sativus*; "Khurbooza," *Cucumis Melo*; "Turbooza," *Cucurbita Citrullus*; "Kukree," *Cucumis utilissimus*, &c.



And used as condiments we have—

“Lal-mireh,” *Capsicum frutescens*; “Ajwain,” *Ptychotis Ajowain*; “Sounf;” *Feniculum Panmorium*; “Aneeson,” *Pimpinella anisum*; *Cichorium intybus*; “Lusson,” *Allium sativum*.

The following may be considered as a rough sketch of the vegetation round a village of the district. Close to the village there are generally one or two small plots of garden ground, in the vicinity of the wells from which they are watered. These gardens are carefully surrounded by a strong and tolerably high fence of the branches of the “Keekur,” *Acacia Arabica*. Round the margin of these plots principally, and in close proximity to the wells, will be found trees of the “Keekur” *Acacia Arabica*; “Baer,” *Zizyphus jujuba*; a few “Lessoora,” *Cordia Myxa*; an occasional “Burna,” *Crataeva religiosa*; sometimes a “Sissoo” *Dalbergia Sissoo*; and not unfrequently some fine specimens of the *Ficus Indica*, “Bore” and *F. religiosa*, “Pipul.” Then come plots of ground a little larger, enclosing tobacco, cotton and sugarcane, the last uncommon in this tract. These several plots are more or less watered from the wells, but with these exceptions no further irrigation of the crops in general is carried on.

The rest of the fields open out beyond with no divisions between them, except perhaps a footpath; wherever a hedge of any sort is met with, one may be certain of the close proximity of the dwellings of the natives or of places for housing cattle.

A few fruits, the produce of the district, are sold in the market. The chief of these are the mangoe, in a green and unripe state and of poor quality; the orange, sweet lime, and citron, all excellent; also, during nearly the whole year, the plantain. In the gardens of Europeans, however, we have a large number of English vegetables cultivated, with such fruits as the grape, fig, guava, apricot, peach and strawberry, all good of their kind.

#### TREES.

Most of the trees in the Jhelum tract have been introduced, though many have become naturalised; few indeed can be said to be native to it. We will therefore in writing of them, class them under two heads.

- 1st. Trees which have been introduced.
- 2nd. Trees which are native to the district.



1st.—Of trees that have been introduced we have—

*Cordia Myxa*, “Budda-lessoora.” The large-fruited Lessoora. This yields the large kind of Sebesten. It is a handsome showy evergreen tree, with good-sized timber, but is only found in gardens.

*Cordia latifolia*, “Lessoora.” This tree yields the small Sebesten, which is scarcely used. It is found in most of the gardens in the district. It has small timber, which is not put to any use in particular.

*Syzigium Jambolanum*, “Goulab Jaman.” Of this there are a few fine trees, generally near the dwellings of Fakirs. There is one tree on the summit of Mt. Tilla, fifteen feet in circumference.

*Parkinsonia aculeata*, “Velaiti Kekur.”

*Sesbania Ægyptiaca*, Pers.

These two latter exist as tree-shrubs: both are true garden plants and are extending their range; both being now occasionally met with near villages.

*Bauhinia variegata*, “Kochnar.” A garden tree, the flower buds of which are used largely in curries and pickles.

*Morus alba* and *Morus laevigata*, Wall. “Toot,” are in this tract dwarfed from want of soil and moisture, and do not yield timber.

*Melia Azedarach*, L. “Buehyan,” Persian Lilae is attached to all villages. The timber is of no use: the foliage gives a good shade and the ripe fruit is greedily seized upon by goats and sheep.

*Moringa pterygosperma*, “Sohounja,” or horse-radish tree, in this tract is a garden product; its fruit is not used for oil making, nor is its timber applied to any purpose. It affords, however, a good shade.

*Populus Euphratica* and *P. dilatata*, Don. “Safaida” are both the products of the gardens of Europeans.

*Acacia Serissa*, Roxb. “Seriss,” grows to a very handsome tree, generally near European dwellings.

*Cedrela Toona*, “Toon,” has been introduced but lately. It both flowers and fruits.

*Bombax heptaphyllum*, L., “Sembul.”

*Cassia fistula*, L. “Amultas,” the Indian Laburnum grows near dwellings, not common; produces good fruit and flowers generally twice during the year.

*Salix Babylonica*, frequently met with near bunces, tanks, and damp localities.

*Ficus religiosa*, "Pipul," and *F. Indica*, "Bore, Burgot," Banyan tree. Fine specimens of these are found throughout the district. It is a matter of opinion as to whether their origin here be due to natural causes or to their having been introduced. If the former, they must be upon the confines of their northern limits.

2nd.—Trees native to the district.

*Cratæva religiosa*, "Burna." This seems to have been at one time a common tree in this tract, more especially upon the alluvial soil near the river, where there are still a number of very large trees which give a splendid shade and form large timber. The fruit is used to mix with mortar for making a strong cement.

*Tamarix Indica, Gallica*, L. "Furas." In this tract the only trees we have of this, have been planted, but in some other tracts we find it is prolific. It produces a miserably poor brittle wood, used chiefly for the fire. This tree resembles a fir and indeed by most people it is generally mistaken for such.

*Acacia Arabica*, "Kekur, Babool." Of this we have two varieties, viz.: *A. A. var. spina, albida*, and *A. A. var. cypress*. This latter is the most elegant but the least common in this tract. They are both large handsome trees yielding good shade, give excellent, useful timber, and grow rapidly and well, over the whole district. Their wood is used largely for ploughs, well wheels and tent pegs; their branches for feeding sheep, goats, camels and cattle in general, as also for making hedges. The bark is used for tanning and making country spirits, besides yielding not unfrequently a large supply of gum, "Gondh."

*Acacia modesta*, Wall "Phulai." In good alluvial soil and where there is drainage this becomes a fine timber tree. Otherwise, as where it grows on the hills and ravines of the district, it is but a poor twisted, stunted shrub, fit only for firewood, but for this purpose it is excellent; camels, goats, &c. feed in Spring on its young leaves and flowers. Its timber is very hard and used greatly for wheels, especially when these are to be exposed to wetting. The heart wood becomes quite black and is as hard as iron.

*Dalbergia Sissoo*, "Sheshum." Of this, which produces the most valuable timber, we have but little, and what trees there are, have apparently been planted during the rule of the English Government in

the Punjaub. A few trees, however, of Seikh times still exist near wells, and shew splendid timber. The natives of the district would induce one to believe that this had formerly been a common tree and that during the Punjaub campaign it had been cut down. I believe it has been introduced since our conquest of the country, with the exception of the specimens near Tullagung.

*Zizyphus jujuba*, "Baer," is a good, rapid growing tree, produces excellent wood, highly valued by the zemindars, and requires no care or trouble to rear; its fruit and leaves yield good fodder to goats, sheep, &c. and its branches make excellent hedges.

The "Baer" and the "Kekur" are the staple woods of the whole district, from which all the woodwork required by the agricultural population is made. They spring up naturally from their seeds, whether distributed by winds, men or animals. They require no care in their youth, and both grow freely without water, (or at least under very straitened circumstances for it,) so long as they have some soil to grow in. On stony, sandy land they do not grow, but on clay they spring up readily. At present there are few or no old trees in the Jhelum tract and decidedly not many in any of the other tracts; that is to say, trees fit for timber. This is due solely to carelessness and negligence on the part of the zemindars to substitute young trees for those cut down; hence there is at present a scarcity of timber, which in a few years, if the present state of things goes on, will end in a nullity of local produce. It appears to me that Government should take up this subject in earnest, and only permit trees of above a certain age to be cut down, making it an established rule, that for every tree cut down, a proportionate number of young trees be planted. The greater the age of the tree cut down, the larger should be the number of young trees required to be substituted for that one removed: and thus, instead of a scarcity of timber, in a few years, a cheap supply of wood grown on the locality would be the result, besides the benefit that would otherwise accrue to a country at present all but destitute of trees. In replacing trees cut down, it is strongly to be recommended that the Baer and Kekur be preferred to any others: not even excepting the Sissoo, which, although a valuable timber tree, takes too long a time to become useful and is too tender, requiring too much nursing in its youth, to be of real paying benefit. The rapid growth of the Baer and Kekur and their non-liability to injury

from want of care, besides their great durability, more especially during exposure to heat and moisture, are characters which render them of immense value to the zemindar, who uses their wood for ploughs and well-wheels where it is continuously exposed to the extremes of moisture and dry heat; besides which, he gets a quick return for the labour and trouble expended in rearing the trees, which are grown on the spot where their wood is required for consumption. Thus he is put to no expense for carriage, while the branches of both trees are of great value to him for fences for his fields, and the leaves, blossom and fruit as fodder for his cattle.

#### CHARACTERISTIC PLANTS.

The characteristic plants of the Jhelum tract may be classed as those met with—

- 1st. On the Islands and banks of the river,
- 2nd. On the moist marshy soil left by the receding of the river,
- 3rd. In wells,
- 4th. As weeds in gardens,
- 5th. As weeds in fields.
- 6th. The remainder are met with on roads, waysides, fields and gardens, in short are not confined to any particular locality.

1st. The characteristic plants met with on the islands and banks of the river Jhelum are :—

*Tamarix dioica*, Roxb. Called in the vernacular generally “Pilehee,” “Jhao,” and frequently “Furas” (the latter name, however, is more generally applied to the tree *T. Indica*). This with *Saccharum spontaneum* covers the islands (balaa’s) during the hot weather, with a dense low jungle. Both are considered of some value for thatching; the former is also used largely for all kinds of rough basket work. From the great abundance of both, and their cheapness, they are used to consolidate the soil laid upon the Grand Trunk Road. By the end of October, the islands are cleared completely of this jungle, and nothing but the roots and stumps of the plants are left, which begin again to send up fresh shoots in March and April. The fresh shoots of the latter are at this time fed on by cattle. Cattle will not, however, feed on the full grown grass, which is too coarse and rough for them. On some of the Balaa’s, but chiefly on the banks of the river on the Goojerat side, the *Saccharum Munja* “Moonj,” is to be met with in large quantities, forming a much higher and thicker

jungle than that of the *S. spontaneum*. Its value is much greater, being used for rope-making. The cause of its high price is, that ropes made from it are able to withstand the effects of moisture combined with strain, much longer than any other rope made from materials as readily obtained. It is largely used by boatmen on the river, as well as for the anchorage of the boats that form the bridges on most of the Punjaub rivers. In 1861, the Moonj harvest was a failure, and in its place large quantities of the leaves of the *Chamærops Ritchiana*, "Puttha" from the Attock district, were imported to the rest of the Punjaub to supply the bridges with moorage rope. The ropes are made by steeping the leaves in water for a certain number of days, then tearing them into ribbon-like strips, which are plaited together upon the principle of the watchguard plait, and then two or three of the plaits are twisted into one rope of the required thickness. The Moonj is said to bear a heavier strain and last longer than the other, when both are exposed to moisture.

The *Anatherum muricatum* "Khus Khus," is met with in some quantity, chiefly on the river's bank, both cultivated and in a wild state, near Russool; also a few miles above Jelallpore. It is of value to the zemindars who sell it for being made into tatties, &c.

2nd. The characteristic plants met with in moist marshy ground left by the receding of the river, &c., are:—

*Machlys hemisphærica*, D. C.

*Mazus rugosus*, Lour.

*Mimulus gracilis*, R. Br.

*Veronica anagallis*, L.

*Polygonum Persicaria*, L.

*Rumex acutus*, Roxb.

*Potentilla supina*.

*Zcuxine sulcata*. The only orchid obtained in the whole district and this only on the banks of the remains of an old canal below the Government garden at Jhelum.

*Alisma Plantago*, L. This flowers early in April, and its presence in this part of the Jhelum district, seems to be due to the river bringing down the seeds from a higher elevation; these vegetate in the pools of water left by the receding of the river. The seeds of the Singhara, *Trapa bispinosa* are also brought down by the river floods in large quantities, but I have never seen them vegetate.



*Potamogeton crispus*, L.  
*Juncus bufonius*, L.  
*Elcocharis palustris*.  
*Isolepes barbata*, R. Br.  
*Scirpus maritimus*.  
*Cyperus rotundus*, L.  
*Cyperus niveus*.  
*Cyperus haspan*.  
*Ranunculus sceleratus*, L.

3rd. In the wells of the district we meet with—

*Adiantum capillus-Veneris*.

4th. As weeds of gardens. Garden weeds are in much greater variety than one would at first be apt to suppose. This is simply due to the presence of a moister and richer soil than that of the surrounding country.

*Fumaria parviflora*.  
*Malcolmia Africana*, R. Br.  
*Sisymbrium Sophia*, L.  
*Sisymbrium Irio*, L.  
*Capsella bursa-pastoris*, R. Br.  
*Lepidium sativum*, L. ?  
*Goldbachia lævigata*, D. C.  
*Oligomeris glauccescens*, Camb.  
*Viola tricolor*, Cult. ?  
*Silene conica*.  
*Silene rubella*, L.  
*Arenaria serpyllifolia*, L.  
*Portulaca oleracea*.  
*Medicago denticulata*.  
*Trigonella incisa*.  
*Indigofera Senegalensis*, D. C.  
*Vicia sativa*, L. and other species.  
*Centaurea cyanus*, L.  
*Anchusa hispida*, Forsk.  
*Nonnea Pulla*, D. C.  
*Antirrhinum crontium*, L.  
*Veronica agrestis*, L.

5th. The characteristic plants met with as weeds in fields.

Early in March *Oxalis corniculata*, *Anagallis arvensis*, *Lathyrus aphaca*, L., and *Asphodelus fistulosus* are seen springing up in immense quantities over the whole of the fields, along with the spring crops. The former are not very injurious, and hence are not weeded out, but the last if allowed to proceed in its growth would undoubtedly choke, at all events, wheat and barley. In some fields that have been sown late and in which none of the corn crop is as yet up, the *Asphodelus* at a very little distance may be easily mistaken for the corn crop. This therefore, when it is large enough to be grasped by the fingers, is carefully weeded out from the cultivated ground.

*Sesbania aculeata* is very common throughout the fields, and during the months of August and September, it may be seen overtopping the Bajree or other autumnal crops.

*Closia argentea*, L. grows amongst the Bajree and Jowar, and is found as a weed from a few inches in height to a shrub of fully seven feet, covered with a profusion of lovely pink flowers. The natives, upon cutting down the crop, curiously enough always seem to leave the plants of this, which remain conspicuous over the reaped fields.

*Baliospermum polyandrum*. This seems to be one of the most difficult shrubs to eradicate, from the large quantity of seeds that one plant bears, and its readiness to germinate. It is not very noticeable until the autumnal crop is cut. Immediately after this, the plant rapidly produces a dark green foliage with flower and fruit, assuming the characteristics of a shrub. It occupies a belt of land half way between the Jhelum and the Ratian range of hills, from which it does not seem to deviate.

6th. Characteristic plants, met with on roads, &c., &c., &c.

*Calotropis procera*, R. Br., "Ak Madar." This is to be found in every part of the district, from the sandy wastes to the most cultivated soil, from the plains of the Jhelum to the heights of the salt range and Mt. Tilla. It is a rank weed, but being easily eradicated, does not give the cultivator much trouble, except on the edges of the fields, where carelessness permits of its growth.

*Adhatoda vasica*, Nees, "Bansa and Bakoor." This also is a disagreeable neighbour to cultivation, but is easily kept at a proper distance. It is to be found at an altitude of from 700 to 3,200 ft. and on the Ratian range of hills forms a belt of vegetation pecu-

liar to the boulders that form a portion of that range. In the ravine country it grows as a large spreading bush.

*Peganum Harmala*, "Hurmoal," forms a thick dense bush about a foot in height and although met with on the low ranges of hills, &c., it is not so flourishing as in the plains, round the edges of fields and on roadsides.

*Tephrosia purpurea*, Pers. covers the plain country wherever it is allowed to grow, and exists as a rank weed especially where there is no vegetation of higher growth than itself: it is easily choked, but where grass like the Doob and similar creeping plants, with *Pimpinella crinita*, Boiss, and *Trichogyne cauliflora*, D. C. cover the soil, as on the parade ground, the plant quickly spreads itself in great luxuriance.

*Tribulus terrestris*, is met with, creeping close to the ground in great quantity over the whole district, with *Malva parviflora*, L.

*Centaurea calcitrapa*, L.

*Microrhynchus nudicaulis*.

*Boerhaavia diffusa*, L.

*Convolvulus arvensis*, L.

*Convolvulus pluricaulis*, Choisy.

*Heliotropium undulatum*, Valil.

*Heliotropium Europæum*, L.

*Solanum Jacquini* Willd "Kuthelee Kunth."

*Withania somnifera*, Dun.

*Chenopodium album*, L.

*Crozophora tinctoria*, Juss.

*Lathyrus aphaca*, L.

*Alysicarpus nummularifolius*, D. C.

*Alhagi maurorum*.

*Nomismia aurea*, W. & A.

*Xanthium strumana*, L.

*Artemisia scoparia*, W. & K.

*Echinops echinatus*, Roxb.

*Ipomœa sessiliflora*, Roth.

*Trichodesma Indica*, R. Br.

*Solanum nigrum*, L.

*Gieskia linearifolia*, Moq.

*Euphorbia dracunculoides*, Lam.

*Viola cinerea*, Boiss.

*Polycarpæa corymbosa*, Lam.

#### HERBAGE FOR CATTLE.

Of grass especially cultivated or allowed to grow for the purposes of pasturage, there is none in the Jhelum tract, for all land capable of producing grass is at once placed under some kind of corn crop. All kinds of cattle are chiefly sent to feed upon the low hill ranges, or upon certain tracts of land covered with the Baer, (from a low thorny shrub to a tree of good size, *Ziziphus nummularia*, Mulla, and *Z. jujuba*) the cattle feeding on the leaves and fruit. Of such Baer jungles there are several in the Jhelum tract, made up chiefly of the Baer, but also partly of the "Kurcel" and "Bakoor," with an occasional "Kekur" and perhaps rarely a few bushes of the *Grewia betulifolia*. Camels manage to pick up their fodder, (which must necessarily chiefly consist of the *Saccharum spontaneum*,) from the islands on the river. This, however, except in a young state, seems to be too hard a grass for cattle generally. Green corn is even cut for horse fodder, and should a cavalry regiment be stationed at Jhelum, the grass-cutters of the regiment have to go down the river as far as Russool, (which is situated fifteen miles further down, on the opposite bank of the river,) for the purpose of obtaining grass.

The grass-cutters of the usual inhabitants get what grass they can along the roadsides, between the edges of fields, or footpaths, &c. and that which is chiefly collected is the Doob, *Cynodon Dactylon*, Pers.

*Pennisetum cinchroides*.

*Aristida depressa*, Retz.

*Digitaria sanguinalis*.

*Panicum Petiverii*, Trin.

*Panicum procumbens*, Nees.

*Panicum antidotale*, Retz.

*Aristida murina*, Cav.

*Lappago biflora*.

*Eragrostis Poæoides*, Beauv.

*Dactyloctenium Ægyptiacum*.

*Koeleria phleoides*, Pers. This may be called the cold weather grass, as it flowers as early as February, and if cultivated, might be of great use as fodder during the cold weather months.

Many other grasses are met with, but the above are the only kinds found generally in the tract. The others in damp and shaded localities, exist rather as botanic specimens than as herbage for cattle.

7th. Of Parasitical plants, the only one met with as yet, has been *Cuscuta reflexa*, "Akas-bel," which is in this tract supported by the "Baer," on Mt. Tilla by the "Bakoor," and at Choya-siden-sha by the "Angeer." (*Ficus caricoides*, Rox.)

#### THE TRACT OF THE LOW HILL RANGES.

Under this head are included the Bukrala, Ratian, Surafur and Kharian ranges of hills. Their geology, physical characteristics and vegetation are similar, and their average height may be considered to be from 1,000 to 1,200 feet above the sea level. Mori Peak, the highest of the Kharian range, is 1,400 feet, and is situated in the centre of that range. Mt. Tilla the most westerly of the Ratian range, is 3,200 feet. The botany of the latter, will, however, be considered by itself hereafter.

These hills are more or less covered with a jungle of low trees and shrubs, besides a few grasses and other herbs. On the whole, however, they present a barren aspect, being covered with a dried-up clay and stony soil, lying chiefly upon sandstone, but here and there upon boulders, and broken up extensively by deep ravines with sandy bottoms. However, in some little solitary shaded nooks, where loamy soil has accumulated, and where there is moisture from some spring, we come upon a herbage of a luxuriance only to be met with in a tropical climate.

The vegetation upon these hills affords pasturage for immense flocks of goats and sheep chiefly, but also of many camels and cattle, which feed upon the blossoms and tender shoots of the shrubs rather than upon the grass, the latter being very scarce in proportion to the former.

This jungle, besides yielding fodder for the cattle, supplies the main part of the firewood for the surrounding population.

The chief sources of firewood in the Jhelum tract, are—

1st. Wood obtained from the river Jhelum by women wading into its shallows, and picking up the wood that has been brought down from the hills, but which is so dense with the amount of water that it contains, that it sinks to the bottom. The women



wade out in large numbers at a time, and feeling with their toes for the bits of wood, pick them up and raise them with their toes. The wood is then placed in baskets and afterwards dried in the sun. This is the cheapest kind of firewood.

2nd. The large roots of trees chiefly of the "Cheer," *Pinus longifolia*, carried down with the floods of the river, but not soaked with water.

3rd. That obtained from the jungles on the low ranges of hills.

The jungle of the low ranges of hills is made up of—

Stunted shrubs of the *Acacia modesta*, Wall. "Phulai." *Capparis aphylla*, "Kureel." *Carissa diffusa*, Roxb. "Karounda." *Sageretia Brandrethiana*,\* "Kohare." *Gymnosporia spinosa*, "Putaker." *Ehretia aspera*, "Chumroor" and "Kookhun."

*Grewia betulifolia*.

*Cocculus laëba*.

*Periploca aphylla*.

*Asparagus*, several species.

*Taverniera nummularia*, D. C.

*Dedonea Burmanniana*.

These constitute the main part of it, but in some portions it may be made up of the *Zizyphus jujuba* and *Acacia Arabica*, both very stunted, with *Adhatoda vasica*, Nees, and the "Dhak," *Butea frondosa*, the last chiefly in broken ground, where also we meet with *Tecoma undulata*, "Looora." On the higher localities on the ridges of Mt. Tilla, we may pick up shrubs of *Olea Europea*, Cow.

The under-shrubs and herbs growing with the above jungle are ;

*Salvia pumila*, Benth. which in many places covers the ground like a grass and is much sought after by sheep.

*Boucerosia aucheri*, "Choonya," a very characteristic plant, springing up from the roots and among the stems of the larger shrubs. The natives collect it and use it largely as a bitter tonic.

*Solanum gracilipes*, Jacq.

*Linaria ramosissima*, Wall.

*Commelyna communis*, L.

*Commelyna Bengalensis*, L.

*Polygala arvensis*, Willd.

\* *Sageretia Brandrethiana*, called after Arthur Brandreth, Esq., Bengal Civil Service.

*Polygala Valliana*, D. C.  
*Astragalus multicaps*, Wall.  
*Pupalea lappacea*, D. C.  
*Dipteracanthus prostratus*, Nees.  
*Ærua javanica*, Juss.  
*Ballota limbata*, Benth.  
*Allium rubellum*, Bieb.  
*Cleome linearis*, Stocks.  
*Abutilon Indicum*.  
*Sida rhombifolia*, L.  
*Triumfetta angulata*, Lam.

Besides the above, we have several grasses:—

*Cynodon dactylon*, “Doob.”  
*Melanocenchris Royleana*, Nees.  
*Pennisetum Cinchroides*.  
*Aristida depressa*, Retz.  
*Eragrostis Cynosuroides*.  
*Dactyloctenium Ægyptiacum*.

In some ravines *Saccharum Munja* and *S. spontaneum* and not uncommonly also *Nerium odorum* are to be met with. The last plant is, however, more common where these ravines open out into the nullahs. It is not to be found on the banks of the river, in its whole course from the fort of Mungla to Shapore, but seems to prefer the hills, as no sooner does one get into the hilly country above Mungla, than it is met with in large quantities on the river bank.

Except during the rainy season, water is not obtainable in these low ranges of hills, unless it be from Bunnees, which are reservoirs of water formed more or less artificially in connection with springs. To these all the cattle are brought from miles round, as the Bunnees are few in number and generally at some distance from each other. The inhabitants of this tract always use their water in preference to any other. In nearly all these Bunnees we have a form of aquatic vegetation peculiar to them. In those of some depth we have *Nelumbium speciosum*, the fruit of which is greatly relished by the natives. In most of them, we have *Nymphæa cœrulea*, *alba*? and *pubescens*, with *Polygonum barbatum*, L. and *Persicaria*, besides—

*Sagittaria cordifolia*, Roxb.

*Marsilea quadrifolia*.

*Potamogeton crispus*, L.

*Juncus bufonius*, L.

*Celsia Coromandeliana*, Vahl.

*Rumex acutus*.

In their vicinity, the vegetation is usually of much greater luxuriance than that of the surrounding country.

#### TRACT OF RAVINES.

This constitutes that portion of the country between the Ratian and Bukrala ranges; as also that to the north of the Bukrala and Salt ranges. It consists of plain ground broken here and there by low elevations, and cut up in every direction by ravines. The average altitude of these plains about Chuckowal and Tullagung is 1000 feet above the sea level. Their geological formation is chiefly tertiary miocene, with little or no surface soil. The vegetation is much poorer than that met with in the Jhelum tract. The agricultural products are chiefly Bajree and Jowar, which are usually very fine, bearing heavy crops if there has been a good rainy season. Wheat is poor, and cotton also, except where cultivated in the courses of the *nullahs* or ravines in which alluvium has been deposited: the small garden plots, for they appear little or nothing more, are then watered from wells sunk at a little distance from the bank of the nullah: this kind of cultivation is well illustrated, at Doomun; where seven or eight wells, with their garden plots of cotton and tobacco are seen, on the margin of the nullah at the base of the fortress. Except near wells or bunnees or tanks, trees other than the Baer and Kekur are scarcely to be met with, and these are uncommon. From Chuckowal westwards, large and fine crops of gram, *Cicer arietinum*, with varieties of *Phaseolus* are raised, this country supplying much of the gram to the rest of the Punjaub.

To the west of Chuckowal the land spreads out into much more extensive plains, and is much less cut up by small ravines than that to the east of it, although traversed by many large nullahs, upon the banks of which good fodder is obtainable, and where we find the *Dalbergia Sissoo*, Sheshum, growing in its natural soil and producing timber by no means to be despised: especially near Tullagung.

Herbage is not procurable for cattle except on the low ranges of hills, and in the ravines that run through this tract, or on the banks

of the nullahs already spoken of, where *Saccharum spontaneum* is frequently to be found growing in great luxuriance, vying with *Nerium odorum*.

During the hot weather the cattle of the zemindars suffer greatly from the want of good water, and their owners have recourse to building mud tanks for collecting water during the rains: to these, as Flemming says, "Men and animals go for drink indiscriminately." Tanks not fed by springs have, apparently for this reason, no vegetation in them, unless it be species of *Pistia*.

The uncultivated land of this tract has a vegetation very similar to that described as existing upon the low range of hills; with this exception, that in the ravines and beds of nullahs, we meet with the "Dhak" *Butea frondosa*, in much greater quantity, in some spots even constituting a jungle, as at Booroo jungle on the Bukrala nullah.

The piece of land, however, on which this jungle grew, has been to a great extent, reclaimed. Near Tullagung are hedges of the *Cactus Indica* growing in great luxuriance.

The Colocynth, *Cucumis Colocynthis*, "Indraun," covers the hard sun-baked ground throughout the whole of the hot weather: *Limeum Indicum* is very common.

#### THE JELALLPORE TRACT

Constitutes that portion of the district that lies between the river Jhelum and the Salt range, from where the Surafur hills come down upon the river, to the town of Pind-dadun-Khan. This tract consists of an extensive plain, spreading from the base of the salt hills to the river, with but a very slight incline towards the latter. The plain consists of a rich alluvial deposit, except at the base of the hills, where it is made up of a mass of boulders, shingle and debris. Interspersed throughout it are tracts of soil impregnated largely with saline matters: the last increasing in amount as we approach Pind-dadun-Khan. In some places torrents from a higher level than that of the salt, deposit loam upon certain lands close under the salt range, making them the richest in the whole district. To facilitate the deposition of the loam, as well as to prevent its being carried off by rains after its deposit, ridges of earth of about eighteen inches in height are thrown up round the fields.

Over this tract wells are very plentiful, with a large supply of water

at a little depth, but the water except in close proximity to the river is saline, and decidedly more so the further west we go.

Where the well water is not greatly charged with saline matter, it is largely used for irrigation, and where the river presents a high bank its water is also raised for the same purpose. At Baghanwalla a small stream from the hills is nearly used up for irrigation.

The chief crops irrigated are,—sugar-cane, rape and cotton.

The crops are the same as those in the Jhelum tract, but the cotton on the whole, is very much finer and the produce much greater.

Sugar-cane is cultivated as a field product and is of fine quality.

Rape “Surson.” Of this, large quantities are cultivated and exported, as also of Til, *Sesamum Indicum*.

Rice is occasionally raised on the islands on the river and on land that is frequently flooded.

Indigo is occasionally grown and brought into the market.

Of Trees, the “Kekur,” and in greater numbers, its variety the cypress, grow in much greater luxuriance than elsewhere, as also do the “Bore” and Pipul, *Ficus Indica* and *F. religiosa*. In this tract we meet for the first time with *Salvadora oleoides*, “Pelu.” It is confined, however, in the most easterly part of this tract, to the immediate base of the hills.

Also close to the base of the Hills, growing in its natural state, as well as introduced into some of the fields near Jelallpore, we have *Moringa pterygosperma*, Sohounja.

The barren soil alluded to as occurring amidst the cultivated land, is covered with a low, shrubby jungle consisting of *Caroxylon fœtidum*, Moq, *Anabasis multiflora*, Moq, *Suaeda fruticosa*, L., the first of which chiefly alone, but not unfrequently with the two latter, is largely burnt to yield Sugce-muttee, a coarse carbonate of soda and potash. In this tract, however, but little is made in proportion to that produced in the tract we shall next speak of, or that of the district of Shapore. Except near the river's bank we have scarcely any of the grasses met with in the Jhelum tract, their place being now occupied by *Elurops repens*, and *Cressa cretioa*.

At Pind-dadun-khan which may be considered the end of the Jelallpore tract, we have very rich alluvial soil supporting some fine trees of *Tamarindus Indica* “Imlee Umlai.”



*Syzygium Jambolanum*, "Jaman."

*Phyllanthus Emblica*, "Howla—Aowla."

*Feronia elephantum*, "Khair," which bears fruit.

*Mangosera Indica*, Mango, highly cultivated in some of the gardens.

*Phoenix dactylifera*, "Khujjoor," which, although we meet with occasional specimens on the river's bank between Jhelum and this place, only here occurs as naturalised, producing fruit in some quantity, and tolerable in quality.

*Guilandina Bonducella*, "Kut-karounja," apparently naturalised, is found in profusion near gardens.

Besides the trees mentioned, we have all the others enumerated as occurring in the Jhelum tract, and all, without exception, having a far finer appearance: this is due no doubt to the depth and richness of the alluvial soil, with a sufficiency of moisture.

From this point passing westwards we enter upon the tract of the salt plains, viz. the plains that lie between the river and the salt range to the west of Pind-dadun-khan for about 30 to 40 miles, that being about the extent of the Jhelum district.

#### TRACT OF THE SALT PLAINS.

In this division we have a tract of country all but a dead level, and in which the cultivation is restricted mainly to the margin of the river, the remainder being near the base of the hills, while between the two, the land is a jungly waste, owing to the excessive impregnation of the soil with saline matter. Through the whole tract, except close to the river's bank, the well water is so bad, that for water for their own use and for their cattle, the inhabitants are dependant on that collected in mud tanks; and for the watering of their crops on rain; except where, as at Keutha, a stream of fresh water comes down from the hills; and in that case it is necessarily used for irrigation. Hence a poor and scanty crop of Bajree and Jowar with a little cotton may be considered the chief products of this tract. Along the banks of the river, however, wheat and barley, with the above, and the oil-seeds are largely cultivated, and yield good crops.

On alluvial soil, as on the banks of the river, or where cultivation is carried on, the Cypress variety of the Kekur, the Baer and the Date-palm may be considered the characteristic trees.

On the land incapable of cultivation we have a jungle consisting of stunted trees, bushes and shrubs, viz.—

*Tamarix Indica*, "Furas."

*Salvadora oleoides*, "Pelu."

*Prosopis spicigera*, "Jand."

*Acacia modesta*, "Phulai."

*Capparis aphylla*, "Kureel," with *Acacia Arabica* and its variety *Cupressus*.

*Suaeda fruticosa*, L.

*Anabasis multiflora*, Moq.

*Farsetia Jacquemontii*, Hf and T.

*Saccharum spontaneum* with *Aëluropus repens*.

Immense herds of cattle are pastured in this jungle, and their fodder seems to consist of the abovementioned shrubs and bushes more than of either of the grasses: the former when in full growth being apparently too hard for them, while the latter only springs up in any quantity during the rains, or as long as moisture lasts in the soil.

During the month of May and when the fruit of the "Pelu" is becoming ripe, whole villages of people go out and stop in the jungles, living solely upon it. This occurs more especially in the Shapore district, where a much greater extent of the jungle exists which is there called the Baer. Men and animals suffer in these jungles extremely from the want of good water, for what they drink is solely that collected from falls of rain.

The fruit of the "Jand" *Prosopis spicigera* is largely used by the natives as a vegetable diet, especially before it reaches maturity, and is considered highly nutritious.

From the "Furas," *Tamarix Indica*, both galls and manna are said to be obtained; the galls are very poor; of the manna none was met with by myself on this tree.

Where the gorges of the salt range open out from the hills into the plains, and shingle, sand and a little soil with a large amount of saline deposit, occupy the intervals between the boulders, we come upon *Rhazya stricta*, Deca, forming a shrubby jungle in itself. It spreads also beyond, to soil that is capable of producing other plants.

On the beds of the saline streams that make their exit through these gorges, *Rumex vesicarius* grows in great abundance.

From the gorges just mentioned, we naturally enough pass on to the salt range, of which we will now treat.

## HILLS OF THE SALT RANGE.

In ascending through the gorges, on the red marl of the salt strata, we meet with two species (undescribed) of *Pluchea* growing in great magnificence and presenting the characters of tree shrubs. These are particularly characteristic plants of the marl.

As we rise still higher, passing above the salt strata, we come upon the "Pupper," *Buxus sempervirens*, occurring in great quantity, more particularly at the head of the gorge at Ketha, and producing wood of good quality which, however, is not used for any particular purpose by the inhabitants. The branches are, however, largely used for thatching, for which purpose the durability of the leaves renders them well fitted.

On the summit of the range, which averages 2000 feet above the plains on the south, we come upon a jungle very similar to that existing on the low ranges of hills, but consisting largely of the Olive, Cow. with *Prosopis spicigera* and an occasional *Acacia Eburnea*, in addition to the plants common in the latter. There is, however, none of the *A. Arabiaea*. Besides these, characteristic of the range, we have *Dodonæa Burmaniana* in great quantity.

*Forskølea tenacissima.*

*Astragalus leuco-cephalus*, Benth.

*Barleria cristata.*

*Lindenbergia polyantha*, Royle, with *Allium rubellum* and several species of *Asparagus*, viz., *raemosus*, *curillus*, &c.

On the southern aspect of the range, from its base to its top, passing up the gorges, we have *Salvadora oleoides* forming a large portion of the jungle. But the moment we rise to the actual summit, and bend our way northwards, not a single plant of it is to be seen, its distribution being limited to the west of the Surafur hills and the south of the salt range.

These jungles supply large quantities of fire-wood but no timber whatever.

## THE PLAINS ON THE SALT RANGE.

These are alluvial plains occurring interspersed throughout the hills, many of them consisting of a limestone formation, and having occasionally streams of fresh water running through them. These streams in general make for the river Jhelum, and entering the salt strata, become impregnated with saline matter, which they deposit on

the salt plains beyond. Through these they are not able to cut their way, but are absorbed by the soil long before they reach the river, and thus instead of aiding in its irrigation, render it incapable of producing a vegetation useful to man.

The plains upon the salt range yield splendid crops of wheat and barley, especially the former, as also all the other crops of the Jhelum tract, except sugar-cane. In addition to these we have in the fields, as at Kulakahar and Choya-siden-sha, opium largely cultivated, as also the rose; from the latter an immense quantity of rose water is distilled, its manufacture being lucrative.

Irrigation is not common, but where streams supply water, the cultivation is laid out in terraces, walled round, to aid in a free distribution of water and to prevent the washing away of the soil.

Where these streams do not exist, water is scarce, wells being sunk generally through rock and to some depth. Hence the fields are solely dependant upon rain, and should a dry season occur, a complete failure of the crops is inevitable.

On the alluvial soil bordering the streams above mentioned, we have *Morus alba*, forming fine timber, especially at Kulakahar; also *Rhus integerrima*, Wall.; "Kuker\*" in great magnificence both at the last place and at Choya; as also *Acacia modesta*, "Phulai," attaining its greatest girth, with *Vitis vinifera* (naturalised) trailed to the top of the highest trees. The Sissoo is rare, although the largest tree of the sort I have ever seen, is at Kutas.

Besides the above—

*Salix Babylonica*.

*Zizyphus vulgaris*, "Jujuba."

*Ficus Indica* and *religiosa* with *Melia Azadirach* are common.

As shrubs on the hilly ground, we have generally those met with on the low range of hills, mixed, however, largely with the Olive and *Dodonaea*, and not unfrequently *Gardinia tetrasperma*, Roxb.

As weeds in the fields, the most characteristic are—

*Salvia Moorcroftiana*, Wall. "Kalather," met with over all the fields.

\* Called also Kuker-singa, because of the horn-like protuberances that are developed upon its branches.

*Edwardsia*, new\* sp. "Koon," said to be poisonous to cows—in great quantity at Choya.

*Eremostachys Vicaryi*, Benth. not common.

*Gypsophila Vaccaria*, L. is very common in the corn-fields at this elevation, growing along with the corn-crop.

*Lithospermum arvense*.

*Psoralea corylifolia*, L.

*Gnaphalium luteo-album*.

*Avena fatua*, L.

*Lepidium draba*.

*Neslia paniculata*.

*Allagi Maurorum*.

In moist damp soil near fresh water, we have—

*Herpestis monnicra*.

*Stachys parviflora*, Benth.

*Samolus Valerandi*, L.

*Cyperus mucronatus*, Roth.

*Apium graveolens*, L. with

*Cynodon dactylon*, in great profusion.

Some fine grazing for cattle is to be had along most of the fresh water streams.

#### MOUNT TILLA.

The most westerly of the Ratian range of hills, is situated 17 miles due west from the town of Jhelum. Its height is 3,277 feet above the sea level. On its Eastern and Southern aspects it presents a scarped face with a direct ascent of nearly 1500 feet. The usual route to its summit is by the western side from near the village of Bagree.

It is covered with a low shrubby jungle at its base, corresponding to that met with on the low ranges of hills, but as we ascend to about 1,200 feet above the sea level, the vegetation gradually assumes a character not found in any other part of the district, and in no way analagous to that at a similar height in the salt range. This is owing to the total absence of the salt rock, which in this hill does not present itself *upon the surface*.—A saline stream makes its escape from the west side of the hill near the village of Bagree.

\* *Edwardsia Hydaspica*, (Edgw.).



None of the characteristic plants of the salt marl have as yet been discovered on this hill, nor a single specimen of the *Salvadora oleoides*.

The first change that we notice in the vegetation as we ascend the hill, is that *Acacia arabica* in the form of stunted bushes gradually disappears, so that it is quite absent at about 1,200 feet. Secondly, grasses become more numerous and present a greater amount of verdure than we have as yet seen, except upon the plains on the salt range.

These grasses are—

*Anthistiria anathera*, Nees.

*Cymbopogon Twarancusa*, Roxb.

*Andropogon annulatus*, Forsk.

*Heteropogon contortus*.

*Crysopogon serrulatus*.

*Apluda aristata*, Roxb.

*Panicum Petiverii*, Trur.

*Pennisetum cinchroides*.

*Panicum antidotale*, Retz.

*Aristida depressa*, Retz.

*Aristida murina*, Cav.

*Lappago biflora*.

*Cynodon dactylon*, Pers.

*Digitaria sanguinalis*.

*Eragrostis poaeoides*.

*Dactyloctenium Ægyptiacum*.

*Melanocenchris Royleana*, Nees.

The first six are the characteristic grasses of Mount Tilla, and cover it with a splendid herbage for cattle, from its base to its summit. This hill with its lower ridges may be considered as affording the best runs for cattle in the whole district.

*Phaseolus trilobus*, Ait., exists in profusion at the base of the escarpment on the east side of the hill, creeping through the long grass and matting it together.

*Lantana alba*, commences about an altitude of 1,000 feet, becoming more common the higher we ascend, and characterising the vegetation of the hill with its lovely white inflorescence.

*Dalbergia Sissoo*, "Sheshum" occurs upon the northwest slopes in

one or two places, as young trees of from 4 to 5 years' growth: here and in some ravines of the Surafur hills it seems to be rapidly becoming naturalised.

*Dodonæa Burmaniana*—"Syna," covers the hill from base to summit on its western slope, forming a remarkably characteristic jungle, (of which there is the analogue in the higher parts of the salt range), and along with it on the same slope, choosing as it were a similar locality, the "Khujjoor"\* *Phœnix Sylvestris* which produces fruit in abundance.

*Bambusa arundinacea*, "Bansa"—growing in great luxuriance in a valley that looks to the south, closed in on its other three aspects by the high ridges of Mt. Tilla. Here the sun seems to have but little effect and abundance of moisture exists. Along with it, we meet, for the first time, with *Rhus integerrima*, Wall. "Kuker," presenting some fine trees and fair timber; as also *Moringa Pterygosperma*, and *Bombax heptaphyllum*, L. "Sembul," the last shewing magnificent inflorescence during March. Of this last, there are some fine trees in the valley half way up Mt. Tilla, on the usual road from Bagree.

At 1,200 feet we meet with *Physorynchus Brahuicus*, Stocks, in profusion. On the low range of hills it is rarely to be found.

*Plectranthus rugosus*, Benth. commences about the same height and forms a dense mass, through which it is nearly impossible to make one's way, and affording excellent cover for chuckoa; it is greedily fed on by cattle and sheep.

*Plumbago Zeylanica*, begins now to shew its fine white blossoms, and *Grislea tomentosa*, "Tawa" in the clefts of the rocks, presents an inflorescence only equalled in splendour of colour by that of the *Bombax* or the *Butea*. This is only to be met with, however, on the eastern face of the hill.

*Olea Europea*, Cow. may be said to commence at 1,500 feet, although found occasionally below this altitude; it is in this latter case but a very small shrub. Indeed at the height abovementioned it is but a shrub, assuming however rapidly the characteristics of a tree. It does not attain its maximum growth under 3,000 feet. On the top of Mt. Tilla there are some very fine trees of it growing through the building of the fakir's temple.

\* The true date palm and the *P. sylvestris* are both called Khujjoor by the natives.

At the same height, species of *Grewia* viz. *G. oppositifolia*, *villosa* and *Rottii*, begin to appear as shrubs, but as we ascend, they put on their true tree form.

We now come upon great tufts of grass, as it were, hanging from the crevices of the rocks and covering the steeper sides of the hill; viz. *Eriophorum comosum*, "Babila," highly valued for rope-making: the rope made from it is chiefly used for tying the earthen dishes upon the Persian wheels. Exposed to continuous wet and in constant use, a rope, the thickness of two fingers, will last during a whole year, if properly twisted.

We now have, at 2000 feet, *Mimosa rubicaulis*, in some quantity. All the good timber of this tree seems to have been cut down by the villagers and shepherds. They have no name for it except "Kekur."

*Rhamnus Persica*, is not uncommon on this hill, but is more common on one of the ridges of the hill to the south-west.

*Rottlera tinctoria*, Roxb. "Rooin, Rolee, Kamela"—exists in great quantity in the narrow valleys leading down from the main hill. Its seed vessels are highly valued as a vermifuge, and are also used to prepare a red dye.

Here also, but in one locality only, viz. on the northern ridge of the hill, we have *Forskolea tenacissima*, a characteristic salt range plant found on strata much superior to that of the salt. And very common over the whole hill is *Melhania abutiloides*, Arn.

*Hibiscus Gibsonii*, Stocks, occurring in some quantity in the valley through which the road leads, between the southern escarpment and the main hill.

*Boerhaavia repanda*, Willd., in great luxuriance along the summit of the face of the eastern escarpment.

*Vitis carnosa*, Wall., with *Cissampelos Pariera* are to be met with all over the hill. The latter, however, prefers the western aspect.

*Colebrookia oppositifolia*, Sm., at about 2,500 feet of elevation, forms a bushy thicket; mixed with it, *Hamiltonia suaveolens*, Roxb. is very common. *Barleria cristata* begins to shew its lovely pink flowers, gradually spreading over the whole hill.

*Tetranthera Roxburghii*, Nees,—not unfrequently met with as a tree shrub.

*Kydia calycina*, Roxb., chiefly as a shrub, but one or two good trees exist upon the hill. From the number of stumps to be found scat-

tered over the hill, it would seem that this tree has formerly existed in large numbers. It is very characteristic, more especially during the winter, when enormous bunches of dried flowers are seen hanging from it, the tree itself being deprived of all its foliage.

*Dæmia extensa*, R. Br. and *Gardinia tetrasperma* are not unfrequently to be met with over the cliffs.

*Asplenium Dalhousiæ* is very common in the nooks and corners of the rocks where moisture collects and affords a damp soil.

Above 2,500 feet we come for the first time upon a species of the genus *Arum*, most likely *Typhonium* (?)

Although at 1,500 feet on the rock above the fort at Mungla, *Amphicoma Emodi*, Royle, is to be found in great luxuriance, I have not obtained it on Tilla under 2,500 feet.

We now see the eastern face of the main hill covered with a shrub producing enormous palmate foliage, but as I obtained neither its fruit nor flower, I can only say that it is most likely to be a *Stereulia* (?)

A single specimen of *Cordia vestita* (?) Hf and T. occurs upon the margin of the tank on the southern shoulder of the hill. From its situation by the tank and its being the only specimen of its kind, it has most likely been introduced.

*Adiantum caudatum* occurs now, in great abundance in damp localities.

*Celtis Caucasica* as a small tree is here common, shewing tolerably good sized timber.

At 3,000 feet we come upon the *Convolvulaceæ* in great luxuriance, viz., *Pharbitis nil*, *Ipomœa muricata*, Roxb., and *I. pilosa*, Choisy, with *Campanula canescens*; the last only in damp localities, where also we obtain that beautiful grass *Batratherum molle*, Nees.

*Galium aparine* with *Cheilanthes farinosa*, in the recesses and clefts of the rocks.

On the very summit we have *Geranium rotundifolia* and *G. lucida*? being the first of this genus as yet obtained, with *Galium aparine*, which indicate a great altitude; besides *Phyllanthus niruri*, *Clematis Gouriana*, *Jasminum grandiflora* and *Vitex negundo*, L.

On the summit of the hill we have a tolerably level piece of ground, partly cultivated by the fakirs, with a miserable attempt at a garden planted by Government; the remainder consists of a mass of jungle. Here we have a temple belonging to the fakirs, with their burying places

scattered over the top of the hill; a small house belonging to Government for the benefit of travellers; and lastly a magnificent tank fed by numerous channels running towards it, from every direction. Except from rain, neither on the summit nor indeed on any other part of the hill, is water to be had, (except from the tank already mentioned on the southern shoulder of the hill). But I have no doubt that if a well were sunk in the valley between the eastern escarpment and the main hill, water would be found at no great depth.

The vegetation on the summit is curiously varied. A splendid specimen of the *Pinus longifolia*, "Cheer," bearing fruit, was introduced 30 years ago by the *Fakirs*. The olive occurs in great luxuriance; the "Khujjoor," *Phœnix sylvestris*, yielding fruit, and the *Ficus Indica*, "Bore." The co-existence of the above four kinds of trees all in full vigour tells us that we must be in a most genial climate; one in which neither the severity of the hot weather nor the dryness of the atmosphere, is too great for the *Pinus longifolia*. Nor does it seem that the intensity of the cold in the cold weather is so extreme that the *Ficus Indica* should not but rival some of the finest specimens of its kind to be met with in the Jhelum district. Together with these two forms we have the "Khujjoor," *Phœnix sylvestris*, in its native luxuriance, with the olive and the pomegranate, *Punica granatum*.

For further information relative to the district of Jhelum, see—

Asiatic Society's Journal for 1848. The camp and battle field of Alexander and Porus, by Captain James Abbott, Bengal Artillery.

In ditto for 1849, Diary of a trip to Pind-dadun-Khan and the salt range, By Andrew Fleming, M. D., Asst. Surgeon, 7th N. I.

In ditto for 1850, Descriptive notice of the Jhelum district by L. Bowring, Bengal Civil Service.

In ditto for 1853. Report on the Geological structure and mineral wealth of the salt range in the Punjaub, &c. &c. &c., by Andrew Fleming, M. D., Edin., Asst. Surgeon, 7th N. I.

Survey of the Jhelum River by Charles Foster, Lt. I. N. in the Punjaub Govt. Reports, No. VI. for 1861, published by Govt.









*On a Land-Grant of Mahendrapála Deva of Kanauj.—By Bábu  
RÁJENDRALÁLA MITRA, Corresponding Member of the  
German Oriental Society.*

In 1848 Mr. J. W. Laidlay, then editor of the Journal, published a translation, by me, of a Sanskrita inscription incised on a large slab of copper which had been presented to the Society by the late Col. J. C. Stacy. It was the record of a gift of land by a prince of the royal house of Mahodaya (Kanauj), and remarkable for being surmounted by a figure of Bhagavatí and the genealogy of the princes named, cast in relief on a tablet of brass. A counterpart of that document has lately been found in the village of Dighwa Doobaneshar, in the Pergunnah of Manghee, Zillah Sarun. Mr. P. Peppe, to whom I am indebted for a transcript of the record, was informed that "it was dug out of a field some years ago by a Dighwaët Brahman of Chhapráh;" but Mr. James Cossierat of Motihári, who has favoured the Society with a carefully prepared facsimile of the monument, learnt on enquiry of the owners that "their ancestors found it in a temple in a ruined Musalman fort in that village, but it was so long ago that they did not seem to have any distinct tradition about it, nor to be able to give any authentic information on the subject." The weight of the plate, according to him, is thirty seers. The surmounting tablet he says "is a casting apparently of iron with a mixture of copper, and the letters raised. It appears of older date than the lower portion of copper engraved. There is a small figure of an idol at the summit; the part left uncopied is a cornice and the idol itself (very indistinct) which I have found it beyond the power of the natives here to take an impression of. The whole of the inscription, however, has been got. The upper portion has been roughly but securely joined to the lower or larger and engraved part. The plate has suffered from fire, the traces of which appear in the indistinctness of parts of the impression."

The size of the monument, the style of the character incised on it, and the tablet and the figure of Bhagavatí which surmount it, bear so close a resemblance to those of the Stacy plate that the two documents seem to have been prepared by the same artist, and inscribed by the same engraver. The genealogy of both begins with the same prince, Devas'akti Deva, but while the Dighwa plate ends with the sixth descendant Mahendrapála Deva, the Stacy record carries it

down to Vináyakapála, brother and successor of Bhoja Deva who was the immediate heir of Mahendra.

The subject of the grant in the Stacy plate is the village of Tikkarika, in the district of Benares, that of the Dighwa record the village of Pámayaka, in the subdivision of Talayiká, of the district of Srávastí.

The date of the Dighwa grant is "the 7th of the waxing moon in the month of Mágha, Samvatsara 389," the last figure being open to question. In my first reading of the Stacy plate I took its date to be "the 6th day of the dark half of the moon in the solar month of *Phálguna* Samvatsara 65," the word "solar" being deduced from an indistinct letter which I took for 𑂔 "light" or the "sun." In the redécipherment\* of the record published in the XXXI. Vol. of this Journal (p. 15) Professor F. E. Hall has dismissed the figures by stating that after the word Samvatsara "follow two unrecognized numerals, denoting a dynastie year, and an indistinct compound character of unknown significance. Further on the day of the semilunation is expressed by a single numeral. It is the same as the first of the two just spoken of." On re-examining the document with the light of the Dighwa plate, I feel disposed to take the first figure for an ancient 4, being somewhat similar to the same figure in the Western caves and on coins. The second is an imperfect or partially effaced cypher, or possibly an 8, but in that case very unlike the same figure in the Dighwa plate; and the indistinct letter after it, which looks very much like a *bhra* and no figure, having the perpendicular line of the long vowel after it, a 9. The figure for the semilunation, being the counterpart of the first figure of the year, must of course be read as 4, making the date "the 4th of the wane in the month of *Phálguna*, Samvatsara 409." This would bring the record 19 years after the Dighwa plate, which would be in no way too much for the latter portion of the reign of Mahendrapála, the whole of that of Bhoja and the beginning of that of Vináyakapála. The last figures, however, being in both the documents very doubtful if we take them for initials

\* It is remarkable that in this so-called "redécipherment" the only emendation of any value is the relationship of Vináyaka Pála to Mahendra. The learned Professor makes him a son, whereas my reading made him a grandson. For the rest the new reading adds little to our knowledge of the document beyond the fact of there being some obvious inaccuracies of spelling in the original which in my reading I had corrected without note, and a few mis-prints in my transcript which had escaped my eyes. The "redécipherment" did not, even in the opinion of the Professor, render a re-translation necessary.

of some now unknown words the dates would read 38 and 40, 45 or 48 as we accepted the second figure of the Stacy plate to be a cypher a 5, or an 8, giving an interval of 2, 7 or 10 years between Mahendra and Vináyaka. I annex facsimiles of the two dates, in order that others may be enabled to solve them more successfully than I have been able to do.

The word *samvatsara* means simply a year and not an era, it is impossible therefore to ascertain to what particular era allusion has been made by the two plates. Had the era of Vikrama been meant, the word *samvat* would have been preferred; besides the character of the plates is too modern to entitle them to a place in the 4th century of Vikrama. If the Ballabhi samvat be assumed the date of the Dighwa document would be carried back to  $(318 + 389 = 707)$  the beginning of the 8th century, which would lead to the anachronism of making Devas'akti and his successor contemporaries of Harshavardhana and co-sovereigns in Kanauj in the beginning of the 8th century; even if it could be shewn that the Ballabhi samvat had extended so far to the north-east of Guzerat—the place of its origin—as Kanauj. Again, if the Harsha era be assumed,—a very likely era being a purely Kanauj one—the date of Mahendra would be brought to the end of the 10th century, when Kanauj was for certain under the Tomaras. Under these circumstances I am compelled to take the era of the records to be a local or family one, the zero of which it is impossible now to determine. This does not prevent us, however, from ascertaining the probable period when the princes under notice flourished in India. Govindarāja, sovereign of Ráshtrakúta in the south Marhatta country, in a donative inscription dated S'aka 730 = A. D. 808, states that his father Paura had once entered Márwar at the head of a hostile army, and “conquered Vatsarāja, who had been intoxicated with the wealth of the king of Gauḍa, which he had seized.” This Vatsarāja was, we suppose, the second potentate of our list and not a prince of Marwar which he is nowhere said to have been, though he was defeated in that country. There is ample testimony to shew that Marwar and a good part of Malwa was, at the end of the 8th and the beginning of the 9th centuries, under the sovereignty of the Kanaujites, and it is more probable that a Kanauj king, in the zenith of his power, should extend his arms as far as Gauḍa on the one side and Malwa on the other, than that a prince



of Marwar should cross the territories of the Kanauj kings in quest of "the wealth of Gauḍa", which could not have been at any time so great as that of Kanauj, notwithstanding the martial successes of some of the Pála rājās of Bengal, who at one time extended their conquests as far as Benares. It is to be admitted that the name Vatsa has been borne by several kings, and that according to Mallinátha and Somadeva, a country, a town, and even a race of men have borne the same title, but the inscription under notice distinctly alludes to a king Vatsarāja who conquered Gauḍa and not to a "king Vatsa" (Vatsa rājā)—and it is evident that at the time when the said Vatsarāja lived, the conquest of Gauḍa from the west could be possible only to a Kanauj king, and therefore we may in this instance from the identity of name assume the identity of person. If this assumption be admitted Vatsarāja must have lived about the end of the eighth and the beginning of the ninth century, at the usual average period of eighteen years to a reign, from 796 to 814, his predecessor Devas'akti, the founder of the dynasty, commencing his reign from 775-76. According to this calculation the several princes will stand as follow:—

Devas'akti A. D. 775-776.\*

Vatsarāja, son of D., 796.

Nágabhatta, son of V., 814.

Rámabhadra, son of N., 832.

Bhoja I., son of R., 850.

Mahendrapála, son of B., 868.

Bhoja II., son of M., 885.

Vináyakapála, son of M., brother of B. II., 900.

This table, however, has to be adjusted with reference to the date of the Stacy plate, which places an interval of, at the outside, only 19 years between Mahendrapála and Vináyaka. And if we provide for it by reducing the reign of Bhoja II. to eight years, we shall bring him to the middle of the eighth decade of the 9th century and make him synchronous with the Bhoja of Gwalior, with whom he was most probably identical.

The Tomaras assumed the sovereignty of Kanauj about the end of the 10th or the beginning of the 11th century, we have therefore a gap of about 80 to 100 years to bridge over to complete the list of

\* In the quotation of this date in my paper on the Bhojas (ante XXXII, p. 96), a misprint has converted the 776 into 779.

Kanauj kings from Devas'akti to the end of the 12th century when the Mahomedans finally conquered the country. To fill up this gap, as far as our knowledge at present extends, we have only two names, those of Sáhasauka and Vira Siñha. The latter was the contemporary of Ádisúra king of Bengal who obtained from him five learned Brahmans to instruct his people in certain Vedic ceremonies.\* This happened according to the genealogical tables and the memorial verses (*Kulapanjis* and *Kuláchárya Kárika's*) of the Bengal Ghatakas in the S'aka year 994 = A. D. 1072. The *Khiti'sávañsávali Charita* places the event in the year 1078, and Ritter's Geography, in 1068 A. D. These dates, however, are all evidently incorrect, as they bring us to the time of Ballála Sena who lived several generations after Ádis'úra. I depend therefore on the genealogical tables for the date of the latter. Of the five Káyasthas who came to Bengal on the invitation of Ádis'úra three, viz., Makaranda Ghosa, Dasaratha Basu and Kálidása Mitra, acknowledged service to the Brahmans and were ennobled by the king as the highest patricians (Kulinas) of his land. The other two, Dasaratha Guha and Purusottama Datta, repudiated the right of the Brahmans to call them their servants and declined to assume the servile title Dása. Purusottam with noble pride exclaimed "A Datta was never a servant." (*Datta káro bhritya naya.*) This temerity deprived them of court favour and brought on degradation to the ranks of the plebeian or Maulika. The Kulina Káyasthas as well as the proud Datta have carefully preserved their genealogy. They hold periodical meetings (*ekajáyis*) at which all the family heralds or ghataks assemble and record the names of every succeeding generation. The last meeting of this kind was held several years ago at the house of Rájá Rádhákánta Deva when the names of the 24th generation of kulinás were duly recorded. The writer of this note is himself one of the 24th in descent from Kálidása Mitra. In some families the 26th, the 27th and even the 28th descent have already appeared, but no where later. Taking the average at 27 generations, we have at three generations to a century just nine hundred years from this date, or A. D. 964, for the time of

\* The *Khiti'sa-vansávali-charita* says, to officiate at the performance of a ceremony for obviating the evil effects of the fall of a vulture on the house top which the Brahmans of Bengal knew not how to perform. The *Ghatak kárika* quoted by Rájá Rádhákánta Deva makes the ignorance more general, but does not advert to the expiation for the fall of a vulture.

the first advent of the Káyasthas in Bengal, and of the period of Vira Siñha's reign.

Of the Brahmans who came to the court of Ádis'úra the most renowned was Bhaṭṭa Náráyana. He wrote the *Venisáñhára* and presented it to Ádis'úra, on his reception by that monarch at his palace in Rámapála. He also wrote a treatise on religious ceremonies entitled *Prayogaratna* which is still extant. He purchased five villages from Ádis'úra which in the time of one of his descendants Bhabánanda Majumadara formed the nucleus of a large principality, that of the Nadia Rájás, who are his immediate descendants. Next to him was S'riharsha of the clan (gotra) of Bharadwája whose descendants form the present Mookerjea family of the Kulina Brahmans.\* No work of any note as far as we know, has been attributed to him. It seems probable, however, that he is the same with the author of the *Naishada Charita*. That work was written by a poet of Kanauj, for he prides himself at the end of his poem for having been honoured with a betel leaf by his sovereign. He also acknowledges himself to be the author of nine different works including among others a "history of the kings of Gauḍa" (*Gauḍorvishakulapras'asti*), "a description of the ocean" (*Arṇava varnana*) and a refutation of some of the leading philosophical systems of the Hindus (*Khandana khanda khádya*). Now Bengal has always been described as the Bæotia of India; its name occurs but rarely in Sanskrit literature, and it is generally called in derision a country to which the Pándavas never came even for a marauding excursion, *Pándava varjita des'a*; while its kings, with the exception of some of the Pálas, were poor, insignificant and unknown. It is not likely therefore that either Bengal or its kings should have been thought of as a fit subject of praise for a royal poet like S'riharsha of Kashmir, or to a laureate of the proud court of Kanauj in the 7th century to whom the *Naishada Charita* and, by implication, the *Gauḍorvishakula-pras'asti* have at different times been attributed. The "description of the ocean" too is not a work of that kind which is likely to proceed from men in the vale of Kashmir or the inland town of Gádhipura. To the former the snows of the Himalaya would offer a more appropriate theme for song than the distant and briny ocean. These objections do not apply to the S'riharsha of Bengal. He was

\* The names of the other three Brahmans were Daksha, Vedagarbha and Chhándaga.

born and brought up in Kanauj, and as a court poet of that kingdom he could well pride himself on the favours he received from his sovereign. He came then to Gauḍa and, to propitiate his new master, thought proper to strike his lyre in praise of his family. In Bengal he must have seen the sea, for it is on record that the five Brahmans came to Gangáságara, and that offered to him a novel and majestic theme for his descriptive powers, while to display his versatility he took up the philosophical treatise *Khandana Khanda*, which is common enough in Bengal but is scarcely known in Kashmir. This assumption, however, probable as it may appear, is, it must be admitted, founded entirely upon presumptive evidence, and must await future more satisfactory research for confirmation. At present it is opposed to the opinions of the late Professor Wilson and of Dr. F. E. Hall.

With regard to Sáhasañka I have little to say beyond what is already known to Indian antiquarians. There were evidently two princes of that name in Kanauj, one a predecessor of Harshavardhana in the 6th century and the other a distant successor in the 10th, probably a contemporary of the author of the *Naishada* who is said to have recorded his biography, although that work is not now extant, and it is impossible to say to whom it referred. Its name, which is all that is left to us, is remarkable; it is *Navasáhasañka charita* which may mean "a new biography of Sáhasañka," in contradistinction to an old one; or "a biography of the new Sáhasañka," to distinguish the hero of the work from a former potentate of the same name who rivalled him in glory, or, as suggested by Professor Hall, "the biography of the nine Sáhasañkas," who, like the nine Nandas of Pátaliputra, reigned successively in Kanauj. If the last be the correct interpretation we shall find in the eight princes of the Benares plate with a hypothetical descendant of the last of the series, just the necessary number for our purpose. In the absence, however, of the original work such speculation cannot lead to any satisfactory result.

*Transcript of a copper-plate grant from Dighwa in Chhuprah.*

(I.) ॐ *a*स्वस्ति श्रीमहोदयसमावासिताने*b*कनौहस्यश्वरघप-  
त्तिसम्यन्नः*c* सुद्धाचारात्परमवैष्णव (II.) महाराज श्रीदे*d*वशक्ति-  
दे*d*वस्तस्य पुत्रस्तत्पादानुध्यातः*e* श्रीभूयिकादे*d*व्यामुत्पन्नः परममा-  
हेश्वर (III.) महाराज श्रीवत्सराजदे*d*वस्तस्य पुत्रस्तत्पादानुध्यातः



श्रीसुन्दरी *f* दे *d* व्यामुत्तन्नः परं *g* भगवती भ (IV.) क्त महाराज  
 श्रीनागभट *h* दे *d* वस्तस्य पुत्रस्तत्पादानुध्यातः श्रीमहीसटादे *d* व्यामुत्तन्नः  
 परमादित्य (V.) भक्त महाराज श्रीरामभद्रदे *d* वस्तस्य पुत्रस्तत्पा-  
 दानुध्यातः श्रीमदप्यादे *d* व्यामुत्त (VI.) न्नः परं *g* भगवतीभक्त  
 महाराज श्रीभोजदे *d* वस्तस्य पुत्रस्तत्पादानुध्यातः श्रीचन्द्र (VII.)  
 (भ)ट्टारिकादे *d* व्यामुत्तन्नः परं *g* भगवतीभक्त महाराज श्रीमहेन्द्र-  
 पालदेवः । आवस्ती (VIII.) भुक्तः *i* । आवस्ती मण्डलान्तःपाति  
 वलयिका-विषयसम्बद्धपामयकग्रामसमु (IX.) पगतान् सर्वानेव  
 यथास्थाननियुक्तान् प्रति *j* वासिनश्च समा *k* चापयति उपरि *l* लि-  
 (X.) खितग्रामश्चार्वा *m* यसमेत आचन्द्रार्कक्षितिकालं पूवदत्त दव-  
 प्राप्यंदयवजि *n* (त) (XI.) मया पित्रोः *o* पुण्याभिवृद्धये सावर्णस-  
 गोत्र कथुमचन्द्रगस *p* ब्रह्मचारि (XII.) भट्टपद्मेसराय *q* सर्वावतुः  
 कुम्भसंक्रान्तौ स्नात्वा प्रतिग्रहेण प्रतिपादित इति विदित्वा (XIII.)  
 भवद्विस्ममनुमन्तयं प्रतिवासिभिरप्याज्ञाश्रवणविधये भूत्वा सर्वोपा-  
 यस्य संस्था (XIV.) पनायै *r* इति श्रीमट्टारक *s* प्रयुक्तस्य शास-  
 नस्य स्थिरायतः *t* ॥ संवत् ३८६ माघसुदि ७ निवृद्धं ॥

a. Not legible in the facsimile, but there is space for it. The transcript prepared for Mr. Peppe has it.

b. The vowel mark is not legible.

c. The visargah is omitted in the original.

d. The vowel mark is not legible in the original.

e. In the Stacy record I took this word for *pádántakhyáta* "celebrated after the foot of another" from *pádasya* "of foot," *ante* "after" *khyáta* "celebrated," the foot standing by a figure of synechdoche for the predecessor, this mode of expressing respect for parents and elder relatives being common in India. Accordingly we see the usual address on letters from a son to his father running, "to the auspicious lotus-like feet of my respected father so and so:" *Amuka-pítá-thákura-mahásaya-s'richarāṇa-kamaleshu*, instead of "to my father so and so, &c." In criticising this reading of mine, Professor Hall in the XXVIIth volume of the Journal, (p. 226), observed, "This epithet would signify, if any thing 'whose toes are notorious.'" He was led to the mistake by referring to his Dictionary for the compound term *pádánta* instead of the separate words *páda* and *anta*.



Commenting on the word *pádánudhyáta* he says, "It appears, from two examples occurring in the same inscription, that it sometimes indicates merely a kindred successor, or perhaps only a successor. Where of two brothers, the elder and younger, the latter accedes to the throne in sequence to the former, the words (?) *pádánudhyáta* are, in the cases alluded to, used to denote their relation as consecutive princes" (ante XXVIII. p. 8). Colebrooke takes the compound to mean "whose feet are revered by," and that is the correct interpretation. It is used to indicate a junior blood relation and successor but never a mere successor, for the expression of respect would be uncalled for in that case.

*f.* The first two syllables of the name obliterated in the original. I supply them from my reading of the Stacy plate.

*g.* For *parama* ; *param* is incorrect.

*h.* *Bhata* for *bhatta*.

*i.* Incorrectly engraved *Yukto*.

*j.* The *r* of *prati* is missing.

*k.* The *jna* is curiously written.

*l.* The *i* of *ri* is omitted.

*m.* The *r* of *rv* is omitted.

*n.* The portion commencing from पुव &c. is legible enough, but of doubtful meaning. I take it for पूर्वदत्तदेवप्रायदाय.

*o.* The *o* of *o* is omitted.

*p.* I know not the meaning of the word *Chandragasa*. It is evidently intended to indicate a particular class of Brahmachári.

*q.* पद्मेश्वराय *recte*.

*r.* पनया in original.

*s.* For भट्टारक.

*t.* The last word is grammatically wrong.

#### *Translation.*

Om! May it prove auspicious! Possessed, through his greatness, of innumerable war-boats, elephants, cars, horse and foot soldiers, and a thorough Vaishnava from the purity of his conduct, was the Maharája S'ri Devas'akti Deva. His son and successor, born of S'ri Bhuyiká Deví, was the devout follower of Mahesvara Maharája S'ri Vatsarája Deva; whose son and successor, born of S'ri Sundarí Deví, was the devout follower of Bhagavati Maharája S'ri Nágabhatta Deva. His son and successor, born of S'ri Mahisatá Deví, was the devout follower

of the Sun Mahárāja S'ri Rámabhadrā Deva, whose son and successor born of S'ri Madappá Deví, was the devout follower of Bhagavat, Maharāja S'ri Bhoja Deva. His son and successor, born of S'ri Chandrabhaṭṭaríkā Deví, was the devout follower of Bhagavatí Maharāja S'ri Mahendrapála Deva who, when in S'rāvastí, thus proclaimed to the assembled crowd of the inhabitants and neighbours of the village of Pámayaka of the subdivision (*vis'aya*) of Valayiká in the district (*Mandala*) of S'rāvastí. The aforesaid village with all its produce, exclusive of what has been already alienated as shares to divinities of the place, has been this day bestowed by me, for the promotion of my parents' virtue, after performance of ablution on the occasion of a conjunction of the sun with the aquarius, and to last for the period of the duration of the sun, the moon and the earth, upon Bhaṭṭa Padmesvara of Sávarṇa Gotra, a Brahmachári of the Kauthuma — ? Sákha of the Sáma Veda. Knowing this, you should abide by it, and the neighbours, mindful of this order, should leave unmolested all the rights and privileges (of the donee). (This is written) for the permanency of the Edict of his auspicious Majesty. Done on the 7th of the waxing moon in the month of Mágha, Samvat 389.

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P. S.—I avail myself of this opportunity to acknowledge the correctness of General Cunningham's last emendation of my reading of the Pehewa inscription. The name of Bhoja's father in that record is Rámabhadrā, as pointed out by the General, and not Rámachandra as originally read by me. The great similarity between *bha* and *cha* in the mediæval Nagari and the commonness of the name Rámachandra led me into error.

The deduction, however, of the first Bhoja of that inscription being the same with the Bhoja of Gwalior is still open to question. To prove the identity the General has been put to the necessity of allowing twenty-five years to each of the eight princes of the time of Devasakti, when our antiquarians are all unanimously of opinion that the average period of an Indian reign has never been above eighteen years. The learned General himself, who holds the highest rank as an authority in all matters connected with Indian Archæology, has repeatedly in his former papers adopted the same average, and I do not see any reason to depart from it in the present instance. Had the Bhoja of Gwalior been acknowledged in any record as the son of

Rámabhadra and a sovereign of Kanauj, the case would have been different, but as it stands we have simply a Bhoja at Gwalior in A. D. 876, but nothing to shew that he was in any way connected with Kanauj or Pehewa, and we cannot therefore at once accept him to be the same with the first Bhoja of Kanauj. The name Bhoja has been so frequently assumed by Indian princes from the time of the Rig Veda to within the last two hundred years, that it cannot possibly be taken by itself as a guide to the identification of persons or dates. The identity of names in such cases can never be a proof of identity of persons. No doubt the Kanaujites had for a time exercised paramount power in Gwalior, but there is nothing to prove that Bhoja son of Rámabhadra did so, nor anything to prevent Bhoja son of Mahendrapála, being the individual named in the Gwalior inscription.

The era of the Pehewa record may be that of Harshavardhana, but that of the Stacy and Dighwa plates cannot be the same, for they place an interval of 113 years between Bhoja and his son Mahendrapála. It is worthy of remark too, that it is odd, that the father and son should adopt two different eras.

General Cunningham observes that the Pehewa record as published by me comprises portions of two separate inscriptions and that I mistook them for one. In explanation of this charge I beg to state that I have never been to Pehewa myself, and that the inscription I published was communicated to the Asiatic Society by Mr. L. Bowring, C. S., who distinctly stated it to be one record, and added that it was "engraved on a tablet of red sandstone in the temple of a follower of the Gorakhnath persuasion," and not on two tablets at different places. On the face of this, all I could say at the time when I noticed the record was, that "the document was divided into two portions, first of which was in verse and comprised twenty-one lines, and the second was in prose and included eight lines." The facsimile was full of lacunæ and blots, and, as now appears, very imperfect, the prose portion containing only eight out of sixteen and a quarter lines. It is a pity that the General who has lately visited and examined the record has not given more detailed description of the places which the two inscriptions occupy in the temple, nor furnished the Society with fresh facsimiles. The missing eight and a quarter lines of the prose portion is likely to throw much new light on the question at issue.

## LITERARY INTELLIGENCE.

General A. Cunningham in a letter to Mr. Grote gives the following results of his late visit to the Punjab.

During my last season's tour through the Punjab I visited all the spots that I could hear of, that gave any promise of yielding remains of interest, and although I have obtained but very few inscriptions, I believe that I have ascertained the position of Taxila in the immediate neighbourhood of Shah-ki-Dheri, beyond all doubt. I believe also that *Sangla-wála Tiba*, or the hill of Sangála is the actual site of the *Sangála* of Alexander. It is a rocky hill rising to 215 feet in height above the plain, and half surrounded by a sheet of water during the rains, but which must have been a permanent lake or swamp 2,000 years ago. The site is covered with very large bricks, and has evidently been deserted for many centuries. The more modern town of *Cheka* as described by Hwen Thsang, may I think be identified with the large ruined town of *Asarur* which is still inhabited.

The point where Alexander crossed the Hydaspes may I believe be looked for a few miles above Jalálpur. I examined the whole neighbourhood carefully, and I am myself satisfied that the Greek camp must have been near Jalálpur and the Indian Camp near Mong. The latter place I look upon as the Nikaia of Alexander, and I believe that the name was changed to *Mog* or *Mong* by the Indo-Seythian king *Moas*, or *Moga*, the reputed founder of the place.

The ruined city near Darápur, on the west bank of the Hydaspes, is now occupied and named *Diláwar*. It is undoubtedly an ancient site, and may dispute with Jalálpur the honor of being the site of the famous Bucephala. Jalálpur itself with its precipitous hill fort of *Gir Jhák*, is one of the most ancient places in the Punjab. I think it may be identified with the *Giri-vraja* of the Mahábhárata.

*Mánikyála* is attributed to Raja *Manik*, and I believe with good reason, as I found a coin of the satrap *Zeionises* son of *Manigal*, deposited in a Tope, which I excavated, along with a relie box marked with the Arian letter J, the initial of the name of *Jihoniya* or *Zeionises*. The relie-box itself is a perfect model of a Tope, the details of the mouldings, and the surrounding basement, corresponding exactly with those of the Great Mánikyála Tope. But the summit is crowned by



a series of four umbrellas resting on a square pedestal, and I conclude that the great Tope itself must originally have been finished in the same manner. I am quite satisfied that Mânikyâla is the holy site where Buddha was believed to have made so many sacrifices of his body to a starving tiger. *Huta-murtti*, which means 'sacrifice, or oblation, of body' is found twice in General Court's inscription, and the ground, as described by Hwen Thsang, is still red with blood of the holy Teacher.

Near Shah-ki-Dheri there are the remains of a very extensive city, with stone walls and square towers and streets at right angles, exactly like Taxila as described by Philostratus. There are also scattered around the city the remains of 30 or 40 monasteries and of not less than 50 Topes, of which two are somewhat larger than the Great Mânikyâla Tope. I discovered the base of a pure Greek Ionic column.

The parade ground of the Rawul Pindi cantonment is another ancient site, which has yielded several didrachms of Azas and Hippostratus besides one unique didrachm of Appollodotus.

Another ancient city exists near Hasan Abdâl and close to Baoti Pind. It possesses several Topes all of which had been opened except one, on the top of a hill, in which I obtained a gold coin of about A. D. 400 to 500.

I still adhere to my original position of Aornos at Nogram, as published in 1848. The hollow or valley on the top of the hill agrees exactly with the descriptions of Aornos, and the place is besides attributed to Raja *Vara*.

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Profr. Holmboe of Christiania draws attention to further discoveries of the relations which formerly existed between Asia and Scandinavia. A summary of these is given in a letter from him to Babu Rajendralal Mitra, of which the following is a translation.

"In the memoir on the Ortug or Tolâ, I showed that the örtug of the mediæval Scandinavians was identical with the tola of the Indians; which is the more remarkable, as no other European nation has made use of a similar weight. The örtug is  $= \frac{1}{8}$  eyris  $= \frac{1}{24}$  of the Scandinavian mark, as in Southern India the tolâ  $= \frac{1}{8}$  pala  $= \frac{1}{24}$  of the sîr. Many of the ancient weights in the museums of Scandinavian countries are marked with points or circles equal in number to their



weight in örtugs. I have enumerated these at pages 1—10\* and compared them at p. 13. I have shewn the probability that the above mentioned weights were used for the weighment of coins and precious metals, as the tolâ is now used in India. I have shewn that there was a period, when the half-mark or 12 örtugs was regarded as a superior unit, and that the ancient rouble of Russia corresponds in weight to the half-mark of Scandinavia. Finally I have at page 24 given a list of several Swedish, Norwegian, Danish and Indian weights, of ancient dariks and of Sassanian gold coins, which have all nearly the same weight.

A belief exists among the lower classes of Scandinavians, that a light sometimes appears over the sepulchral tumuli of pagan times, indicating that a treasure has been deposited in the tumulus. I have compared with this belief the traditions preserved in the life of the Chinese pilgrim Hwen Thsang, concerning the light which it was believed was seen over several Indian topes, and the efforts made by the Buddhist priests to imbue the people with the belief in a luminous power in the topes and dagobahs in the depths of the rock cut temples.

Previous authors have instituted a comparison between the arms of the gods of thunder, Thor and Indra, but have restricted themselves to a comparison of their form and effects. To these I have added in my memoir, a comparison of their consecrating power.

The fourth pamphlet† contains firstly a description of a little bronze hatchet, lately discovered, and secondly the inventory of a sepulchral tumulus which was opened eleven years ago at a spot, about twenty leagues south of Christiania. Among other things were the skeletons of three horses, one of which bore a saddle, the metallic parts of which were of gilt bronze. With this fact I have compared the customs of the Tartars of the 13th century, spoken of by Rubruquis and Jean du Plan de Carpin who relate that the Tartar chiefs were buried with three horses, one of them saddled."

\* Om Örtug eller Tola en Skandinavisk og indisk Vægteenhed.

† Amuletter og om Stormænds Begravelse blandt Skandinaver i Hedenold og blandt Mellemasiens Buddhister.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR JUNE, 1864.

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The monthly General Meeting of the Asiatic Society of Bengal was held on the 1st instant.

Captain W. N. Lees, Vice-President, in the chair.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From L. Bowring, Esq., copies of Photographs of some Inscriptions found at Anantpur.
2. From Babu Ramchunder Mitra, copy of a report of a meeting of the Bethune Society held on the 10th September, 1863, and the address to Dr. Duff from the Society, with his reply.
3. From Lieutenant R. C. Beavan, specimens of schorl in quartz and Zoological specimens, namely, two specimens of *Bungarus candidus*, one of *Calotes versicolor*, a skin of *Felis Jacquemontii* and one of a species of *Lepus*; also two Bear's skulls.
4. From Capt. A. K. Comber, Deputy Commissioner of Debrooghur through Major D. Briggs, the skin of an *Arctictis Binturong*, from the Burhampooter river.
5. From Babu Rajendra Mullick, dead specimens of *Dromaius Novæ Hollandiæ* and *Struthio Camelus*.
6. From T. Tomlinson, Esq., on behalf of His Excellency the Governor-General, a dead Tiger from the Barrackpore Park Menagerie.
7. From J. R. Macdonald, Esq., a leaf cloak such as is in common use among the Kôl labourers at Hazaribagh.
8. From Lieutenant-Colonel R. C. Tytler through A. Grote, Esq., a specimen of a new species of *Tarantulus* from the Andaman Islands.

9. From Mr. C. Swaris, Taxidermist to the Society's Museum, a Bhotanese sword.

10. From Lieutenant-Colonel Thuillier on the part of Mr. Mulheran of the Hyderabad Topographical Survey, a set of 18 Stereoscopic Views of the Caves of Ellora and Ajunta.

11. From A. Carlyle, Esq., copies of his work entitled "the Tale of the Battle of Padmanabham," with a Telugu translation of the same.

12. From the Government of India, through H. R. Carnac, Esq., a fine specimen of a fossil Amphibian from the Pachmari Hills.

Mr. Blanford called the attention of the meeting to this very interesting specimen, which had been expected for some time past, but had only arrived a few days ago. "It was discovered in the early part of last year by Major Gowan, exposed on the face of a block of sandstone lying on the right bank of a small mountain stream about a mile to the westward of Bijori, in the Chindwarra district. The block lay at a spot where the stream is crossed by the cattle road passing from the hill plateau of Pachmari viâ the Rhoi pass and Bijori to Mohtoor, and the fossil appears to have been well-known to the natives as the "Machli Katta," (fish bones.) The exact spot has been marked by Lieut. Sim (who subsequently visited the place) on Mr. Medlicott's geological map of Central India, and is on a tract coloured by Mr. Medlicott as the Mahadeva sandstone, a formation of great thickness forming the mass of the Pachmari Hills and resting unconformably upon the coal and plant-bearing groups, part of which are contemporaneous with the lower part of the coal measures of the Ranigunge field. The age of the Mahadeva sandstones is unknown, no fossil remains having hitherto been found in them, but they are overlaid by trap-rocks with intercalated fresh water deposits, the age of which has been lately determined by Mr. W. T. Blanford as pre-nummulitic, while from data afforded by the late Mr. Hislop and others there seems but little doubt that these fresh water deposits are not older than the newest deposits of the Cretaceous period.

Major Gowan's report on the discovery of this fossil was forwarded to the Society by the Government of India, in May 1863, and its importance having been pointed out, the Chief Commissioner of the Central Provinces was requested to have the specimen procured and forwarded to Calcutta. The fossil was shortly afterwards removed by Lieutenant Sim, R. E., carefully packed to prevent injury, and

forwarded to Nagpore, where it remained in the charge of Mr. H. R. Carnae, awaiting an opportunity of being forwarded to Calcutta, in the charge of some trustworthy person. Meanwhile photographs of the fossils were taken by Mr. Crommelin who had kindly placed the negatives at the disposal of the Society, prints from which were exhibited at the April meeting of the Society.

“From an examination of the specimen as at present exposed, it appears to be allied either to the *Archegosaurus* or the *Labyrinthodon*, but the state of the specimen does not at present admit of its precise affinities being accurately determined. It exhibits a nearly perfect cast of the skull, the roof bones being wanting, and probably having remained attached to the matrix when the fossil was removed. The form of the skull and the position of the orbits are, however, distinctly shown; the mandible is partly preserved, but the teeth are all broken through longitudinally, and so worn away that little more than their general form can be traced. The palatal bones and all the floor of the skull are probably preserved, but hidden by the hard sandstone which fills the cavity of the lower jaw. The base of the skull is also imbedded, and the existence of condyles, the presence of which would determine its *Labyrinthodont* affinities, cannot be ascertained.

“When found, the position of the specimen was reversed, the ventral face being uppermost, and a portion of the dorsal vertebræ and ribs, or rather their impressions, being exposed on the surface of the stone.

“The ribs are short, very slightly curved and flattened at their distal extremities; their attachments are not seen. There is some question as to the centra of the vertebræ; if, as Dr. Partridge thinks, the continuous series of hour-glass-shaped sandstone bodies visible represent the centra, the notochord must have been persistent, and this character would place the fossil nearer to *Archegosaurus* than *Labyrinthodon*. Some squamose plates partially exposed on the ventral surface of the throat tend to bear out the idea that the present species is *Ganocephaloid*, but further investigation with hammer and chisel is required to settle the point.

“To whichever group this fossil may eventually prove to belong, its geological indications are much the same. The *Ganocephala* have indeed hitherto been met with only in rocks of the carboniferous age, whereas *Labyrinthodonts* are known to range from Carboniferous to Upper Trias

or possibly the Lias, but no great stress could be laid on such a degree of difference in range, the remains of such animals being everywhere rare. Both groups are characteristic of the great transition fauna intervening between that of the Silurian and Devonian systems and that of Mesozoic times. So far as one can predicate the geological age of such remains from our present knowledge, we may refer the fossil either to the Carboniferous, Permian or Triassic period, with a preponderant probability in favour of the former.

“Until the geology of that part of the Mahadeva hills in which the fossil occurs has been re-examined by some one acquainted with the local peculiarities of the rocks, it will be premature to offer any opinion as to the age of the Mahadeva sandstones. The belief I have entertained for some years past is, that they are cretaceous, a belief partly founded on Mr. Theobald's inference of their relation to the Baug beds, partly on their geological relations to the trap rocks already mentioned, and which rest conformably upon them; but if the specimen on the table be really from the Mahadevas, this formation must go back to a very much more ancient period. It should be mentioned as bearing on this point, that the mineral character of the matrix of the fossil is a hard gray micaceous sandstone such as is very characteristic of the coal-bearing rocks of India, but is very different from the typical sandstones of the Mahadevas, which are soft coarse grits with little specks of Kaolin, and frequently ferruginous.

“Labyrinthodont remains have twice before been discovered in India, viz. at Mangali about 120 miles south of Nagpore and in the formation which overlies the upper coal-bearing rocks of the Ranigunge coal field, and which has been termed by Mr. W. T. Blanford, the Lower Panchit Group.”

In conclusion Mr. Blanford expressed the indebtedness of the Society to those gentlemen to whose exertions the Society owes this highly interesting fossil, and proposed that the special thanks of the Society be voted to Major Gowan the original discoverer, to Mr. H. Rivett Carnae, who had throughout taken an active part in procuring the fossil, and in getting it photographed, and finally in transmitting it to Calcutta; to Lieutenant Sim, R. E., who had gone to its site, expressly to obtain it, and to Mr. Crommelin, who had photographed it and presented the negative plates and several prints thereof to the Society.

This proposition was unanimously acceded to by the meeting.



A letter from I. Bowring, Esq., relating to the copper Sásliana from Mysore was read.

The following gentlemen duly proposed at the last meeting were balloted for and elected ordinary members :

Brigadier General H. G. D. Showers ; R. E. Goolden, Esq. ; J. O'B. Saunders, Esq. ; Moulvi Moula Bukhsh Khan Bahadoor and Babu Jadu Nath Mookerjee.

The following gentlemen were named for ballot as ordinary members at the next meeting :

Lieutenant H. Trotter, R. E., G. T. S., proposed by Captain Montgomerie, R. E., seconded by Lieutenant-Colonel Thuillier.

J. C. Whishaw, Esq., Civil Surgeon, proposed by Captain W. N. Lees, seconded by Mr. H. F. Blanford.

Babu Debendra Mullick, proposed by Mr. Grote, seconded by Mr. H. F. Blanford.

With reference to the proposal of Dr. Jerdon that Mr. Blyth be elected a corresponding member of the Society, the Council reported that in their opinion the proposed election would confer no additional distinction on Mr. Blyth, that gentleman being already an associate member of the Society.

The Chairman reported to the meeting that the announcement made at the last meeting that Mr. Beaufort had withdrawn from the Society was erroneous ; Mr. Beaufort's name had therefore been restored to the list of members.

The Secretary read the following letter from Colonel Thuillier :

To H. F. BLANFORD, Esq.

DEAR SIR,

6th May, 1864.

"Having gone out of the Council of the Asiatic on rotation in virtue of a principle introduced for the benefit of the Society, I do not consider myself eligible for re-election at so early a period. I regret therefore that it is not in my power to respond to the honor which the Council has been so good as to confer on me, and I must beg of them to excuse me."

Your's faithfully,

(Sd.) H. L. THUILLIER.

The report of the Council appointing Mr. H. Scott Smith as a member of their body in the place of Mr. H. Leonard was confirmed.

The Council reported that they had elected Mr. H. B. Medlicott and Mr. Oldham to the Council in the place of Colonel Dickens, who had resigned, and Colonel Thuillier who had been elected, but had declined to accept the office at present.

They further reported that the following gentlemen had been elected to the Committees :

*Meteorological Committee.*—Colonel H. L. Thuillier and T. Martin, Esq.

*Natural History Committee.*—Lieutenant R. C. Beavan.

*Finance Committee.*—H. D. Sandeman, Esq.

They also reported that they had appointed Mr. A. Carlyle as Officiating Curator of the Society on a salary of Rs. 250 per mensem, on the express understanding that the appointment should be a temporary one.

Communications were received—

1. From E. Thomas, Esq., a paper on Ancient Indian Weights.
2. From W. Theobald, Esq., Jr., a paper entitled "Observations on Certain Strictures of Mr. H. F. Blanford on my paper on the distribution of Indian Gasteropoda in Journal, No. 289, Page 69."
3. From Dr. A. Bastian, a copy of a translation of the oldest stone inscription found in Siam.
4. From Baboo Gopinath Sen, an abstract of the Hourly Meteorological Observations taken at the Surveyor General's Office for the month of March last.

The papers of Dr. Bastian and Mr. Theobald were read.\*

Mr. Blanford in reply to Mr. Theobald's remarks, admitted that Mr. Theobald had very properly corrected him on the question of authority, and that he must therefore modify his statement somewhat carelessly made on a former occasion that no Naturalist of any eminence held the view that species were of sporadic origin. He did not think, however, that this correction made any material difference as to the real point at issue, viz. whether there were any good grounds for inferring that one and the same species had commenced its existence at more than one centre. Mr. Blanford had not seen the work quoted by Mr. Theobald, but if Mr. Theobald's quotations fairly represented the arguments for sporadic origin, he thought they were quite inconclusive, and the facts adduced in support offered nothing new or

\* These will appear in due course in the body of the Journal.

not contemplated by Mr. Blanford in his former objections to Mr. Theobald's deduction. The argument was that in two distinct drainage basins, the majority of the species were distinct, whereas one, the pickerel, was common to both, and the inference drawn was that therefore the pickerel had commenced its existence as a species in the two areas independently. But similar phenomena are of common occurrence, though exceptional, as compared with the general facts of distribution—and it did not seem that they justified the conclusion drawn by M. Agassiz. It would be impossible to offer more than suggestion towards explaining the particular case quoted, in a manner reconcilable with the view that the species of pickerel had originally proceeded from a common centre, inasmuch as many very important data bearing on the case were not at hand. He would therefore make some general suggestions, and illustrate them by a parallel case, with which he was more acquainted, being in fact that which had given rise to this discussion.

When it is said that species are distinct, nothing more is as a rule really implied than that two series of forms shew such a degree of difference that it is convenient to distinguish them by different names. When the differences are small it is usual to call them varieties, but at the present day the distinction between species and varieties can be merely regarded as one of degree, and whether a new set of forms is treated as a species or variety, depends partly on the habit of the describer, partly on the amount of information he possesses as to the existence of intermediate forms.

The definition of Cuvier, which had long been accepted by naturalists, that "A species is a collection of individuals descended from one another, or from common parents, and from those which resemble them as much as they resemble themselves," is clearly of no use when the question under discussion is whether two given distinct sets of forms are, or may be, descended from a common stock. Actual degrees of resemblance are in most cases the only criteria at the command of a naturalist, and in a few cases the power of interbreeding and producing fertile progeny. But the inferences drawn from the latter are by no means always in accordance with those drawn from the former. The recent investigations of M. Ch. Naudin on the hybridity of plants proved that in certain cases, species which in external and anatomical characters were only distinguishable by great practice,

and which indeed "most Botanists fail to distinguish" resist all attempts to cross them, while others very different from each other, and universally recognised as species easily give origin to fertile hybrids. Man is generally regarded as a single species, but M. Paul Broca brings forward a multitude of facts to shew that between the different races of mankind, the degrees to which crossing is possible vary greatly, and that the Australian and European do not produce a permanent mixed breed. The same appears to be the case in Ceylon, where the Portuguese and Dutch have left scarcely any descendants of mixed blood, and where there is good reason, on excellent authority, to infer that were the English now to leave the Island, the same extinction of the mixed race would shortly supervene. Much more might be said on this point, and to show that hybridity is not a simple phenomenon, but exists in all degrees and is affected by slight changes of condition.

If, then, interbreeding be taken as the criterion of species, resemblance of apparent character which is in most cases the only point ascertained, is clearly not reliable. The Chinese and Indian pheasants interbreed freely although very different in plumage, &c., and the mere fact of two forms differing to such an extent as to be entitled to receive different names is no argument that their origin is distinct even according to our present knowledge, and on the unproved and apparently improbable assumption that forms of common descent in all cases interbreed freely.

In the case adduced by M. Agassiz, we do not know how far the species termed by him distinct are really so on other than grounds of external difference, and the case therefore cannot be argued. It may be that at a former geological period communication existed between the two basins, and that there was a dispersion of species, that since the separation certain of these have so varied in one or both areas as now to be regarded as distinct, while the pickerel has not so varied. Again, two rivers flowing respectively north and south would afford conditions so different that certain forms formerly common might become extinct in one case or the other, whether by change of climate, by collision with new species of other forms of life, in short by a change in any one of those numerous conditions which affect existence and the destruction of a balance of favourable conditions previously existing. All these are possibilities which, although they can be merely



suggested, still require investigation before the inference drawn by M Agassiz can be admitted.—To take a case better capable of argument; that of the Hill Mollusca of Southern India. It is an actual fact that while certain of the species, as *Helix Castra* are common to two or more isolated groups, others, such as the *Diplommatinas* differ on two hill groups, but are more closely allied to each other than to their congeners on the Himalaya or elsewhere. This latter may be regarded as a case in which specific variation has supervened since that communication of conditions existed between the hill groups, which has been inferred on geological grounds. The *Streptaxes* differ less than the *Diplommatinas*, and it is questionable whether on the score of difference of external characters alone they should be treated as species or varieties, so that here we have gradations of difference up to actual identity. This is certainly in accordance with the view that variation has supervened since separation, and is not accounted for rationally by the assumption that each hill group is an original centre of specific distribution.

Mr. Theobald has much combated and ridiculed the idea of accidental distribution by floating timber, &c., but now apparently admits it as an occasional though rare phenomenon. It was never regarded by Mr. Blanford as otherwise than exceptional, but there may be other modes of distribution by transport, not yet known or fully appreciated. In a paper lately transmitted to the Linnean Society, Mr. Blanford had remarked upon certain facts of distribution of *Melanix* and *Paludomi* which seemed to support Mr. Darwin's view that birds are active unconscious agents of transport. The *Melanix* and *Paludomi* of marshes, tanks, estuaries, &c., which are much frequented by water fowl, are of extremely wide distribution. Those of hill streams, which are not frequented by water fowl are of very restricted range, and even in small areas, as in the hill region of Ceylon, two adjacent streams not communicating were tenanted by forms so different that they had in a great number of cases been described as distinct, although as Mr. Blanford had shown by the comparison of large numbers taken from a great variety of localities, they were almost unquestionably mere varieties, that is, that the most diverse forms were connected by intermediate gradations. How communication originally took place can only be surmised, but the comparative absence or rarity of communication had here admitted of great local



variation, which was treated as specific until a thorough investigation with ample materials had been undertaken.

The theory of common descent of animals and of plants must require centuries of investigation to establish it, but reviewing the whole history of Biology hitherto, Mr. Blanford could not but arrive at a conclusion similar to that of the veteran Schleiden. "Wonderfully strange and even absurd as the thought may appear to-day to many, that all organisms on the earth, vegetable as well as animal, extinct as well as living forms, are connected with one another as a single great family by natural descent, a man need not be a great prophet to tell, that before long, this doctrine will be the currently accepted and unquestioned property of every man of Science. Though at present many intelligent and many unintelligent voices are making themselves heard against Darwin, he has already a large number of powerful allies on his side, and the result cannot be doubtful."

The chairman then read an extract from a letter from General Cunningham to the address of Mr. Grote on the subject of the Pehewa inscription, which extract appears as a postscript to General Cunningham's paper on that subject in the present number of the *Journal*, p. 229.

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